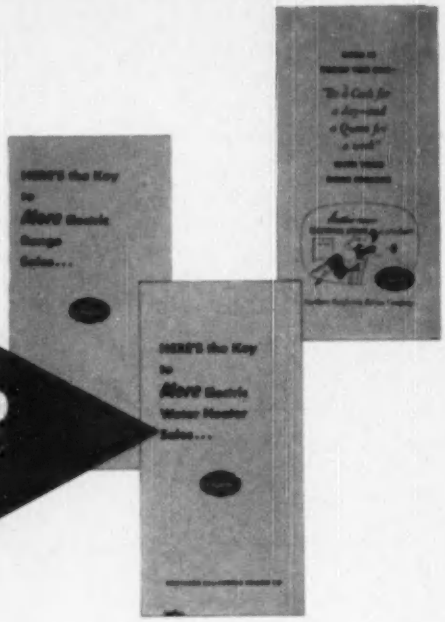
ELECTRICAL WEST

March 1950
25 cents

Movies Woo Good Will, Page 63
Appliances, Page 86

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

what's the point?



In personal contact with the buying public, this is increasingly evident: It takes *facts* to turn inquiries into sales. Today's appliance salesman is quite likely to resemble a whole group of quiz program contestants!

Generalizations—"new and improved," "more efficient," "cheaper to operate," "does more things better"—all of these are good only to a point.

What is that point? It is when the customer asks "Why?" and "How?"

That is the reason for these Edison appliance selling manuals, developed at the request and with the cooperation of appliance dealers. Pocket-size, unusually comprehensive, they are filled with facts about costs, capacities, installation and operation, together with suggested selling points.

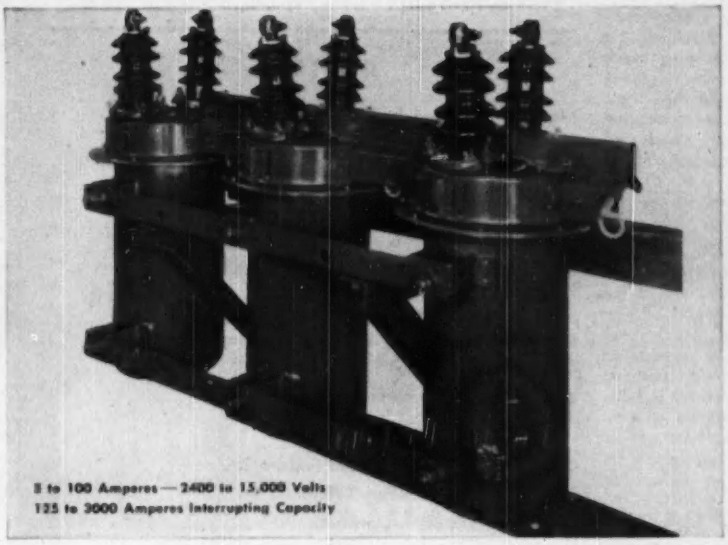
As a part of Edison cooperation with dealers, these manuals are made available to salespeople in stores everywhere in Edison territory. They are proving invaluable—sales go more smoothly when the salesman can match answers to questions on any point, without hesitation.

SOUTHERN CALIFORNIA EDISON COMPANY

Edison

new TYPE FR-3

THREE-PHASE AUTOMATIC RECLOSER



2 to 100 Amperes — 2400 to 15,000 Volts
125 to 3000 Amperes Interrupting Capacity

General Electric's new FR-3 three-phase relayed automatic recloser extends the many advantages of the G-E Type FR-1 single-phase recloser to three-phase operation for rural distribution systems.

SIMPLER—Three FR-1 single-phase reclosers of the design that has been time-proven in service have been combined as a single unit designated Type FR-3. Thus . . .

INTERCHANGEABLE PARTS greatly reduce maintenance costs. As the FR-3 is essentially three FR-1 single-phase units, it's necessary to carry in stock parts for only *one* type of recloser.

COMMON LINKAGE ties together the lock-out mechanism of the three reclosers, thus assuring positive operation. Having three reclosers working as a unit eliminates the hazard of burning out three-phase loads by one phase locking-out while the other two phases remain closed.

INTERMITTENT FAULTS cause the three reclosers to operate independently, as a single-phase recloser.

PERMANENT FAULTS in any one phase will automatically lock-open all three reclosers. Close one and you close all three.

THREE SEPARATE TANKS—instead of one big tank—greatly reduces the possibility of phase-to-phase faults, and thus further improves your service continuity record.

For complete information on the General Electric Type FR-3 recloser ask your G-E Sales Representative for a copy of GEA-5466, or write to *Apparatus Department, General Electric Company, Schenectady 5, New York.*

GENERAL ELECTRIC

with factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

MARCH 1950

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright. Sixty-second year of publication

ELECTRICAL WEST

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Next Month

Leading off next month will be an article by the editor. It is an adaptation of an address by George Tenney before the San Francisco Electric Club. He reviews the progress made by the electrical industry during the past half century under free enterprise. With ominous clouds on the horizon, he looks ahead on the last half of the century with mixed feelings of promise and misgiving.

In engineering, there will be a feature on the Toketee low-cost hydro plant of the California Oregon Power Co. Another article will deal with an engineered system for limiting demand on space heating installations. There will be an article either on solution of noise on a power plant PA system or on television interference.

Lighting and wiring will include articles on low-voltage control for a university building, street-car barn lighting, lighting jobs sold by a Boise contractor, and one on a contractor's set-up for handling fluorescent lighting maintenance for merchants on a service contract basis.

Again this year one of the editors will cover in pictures the big spring industrial electrical show of the Electrical Maintenance Engineers Assn. of Southern California. All of the regular features will be included, of course.

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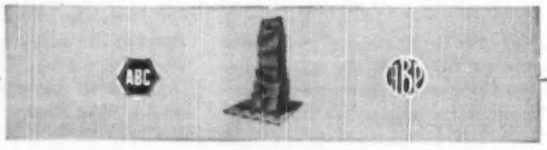

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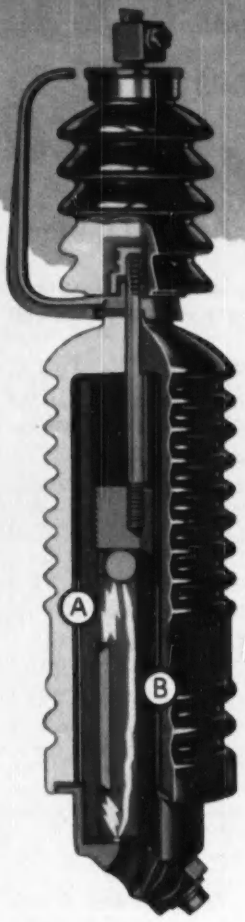
L-M ANNOUNCES NEW LOW SPARKOVER LEVELS



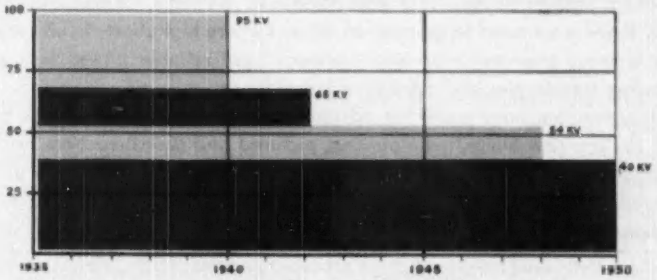
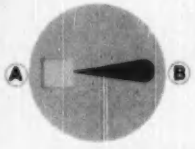


Chart shows reductions in critical impulse sparkover of 9 kv expulsion arresters. Successive improvements give L-M Expulsion Arresters the lowest impulse sparkover in history, the longest life in service.



Cross section of arcing chamber

outstanding improvements achieved by L-M Surge Laboratory research, development

● The extremely low sparkover recently achieved by L-M research answers one of the big objections to the use of Expulsion Arresters. With the new low sparkover voltages, these L-M arresters now give greatly increased protection throughout range of ratings.

Arrester life has also been substantially increased, by means of the L-M arc switching principle. Two electrodes are provided, in the narrow side of a wedge-shaped fibre arcing chamber. Jumping the short gaps at **A**, the arc forms gas that forces it into a long thin arc at **B**—and then almost instantly it is blown completely out of the chamber. The arc does not remain long enough to burn the electrodes and is extinguished so rapidly there is no appreciable erosion of the fibre.

No limit to system capacity on which this expulsion arrester may be used. Meets the NEMA-standard 65,000 amp discharge test with an ample safety margin. Available in 3, 6, 9, 12 and 15 kv sizes, with flat or cross arm mounting hangers. Wet process porcelain housing with rain-shed umbrella design. Strong clamp-type terminals. Heavy external gap electrode, eliminates accidental bending and changing of external gap spacing.

WHO DUNIT... AND WHAT!

Here's a thriller for those interested in expulsion arresters—the story of lightning arrester development and performance of the L-M PF-3 Expulsion Arrester. Ask the L-M Field Engineer for a copy of Bulletin LA3, or write Line Material, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

7487

LINE MATERIAL Lightning Arresters

Complete Coordinated Equipment for Distribution Today

NOW! { 4500 amperes / 6900 amperes / 8600 amperes } POWER FUSE protection for $11.60 / 16.80 / 20.25

Can you

PRICES ARE WAY DOWN — on S&C Liquid Power Fuse equipment for 7,500- and 15,000-volt installation, making its dependable performance available for wider application.

Now there is no need to gamble on cutouts where high short-circuit currents are available. Nor is there need to pay a heavy premium over cutout prices to get reliable power fuse protection for 6,900- to 13,800-volt distribution transformer and substation installations.

Two innovations have made the advantages of the Liquid Power Fuse available at the new low prices shown below: (a) The new Simplified Mounting, pictured and described here, which is **better**, yet cheaper, than the conventional switch insulator type mounting it replaces and, (b) a new plan for the purchase of Liquid Fuses which reduces prices and does away with the need for returning blown fuses to the factory for refill.

Comparison of interrupting ratings and costs① of the Liquid Fuse with other typical protective devices follow:

	Ordinary Open Drop-Out Cutouts		Drop-Out Power Fuses				Liquid Power Fuses With Simplified Mounting			
			Expulsion Type Using			Solid Material Type				
			Fuse Link		Fuse Unit					
Ampere Rating Range	To 100E	100E to 200E	To 100E	100E to 200E	½-125E	½-200E	1-10E (Size 1)	10-20E (Size 2)	½-50E (Size 3)	½-125E (Size 4)
	7500 VOLTS									
Interrupting Ratings in amperes, rms, asymmetrical	2000	4000	4000	6000	5000	12,000	4500	4500	6900	8600
First Cost②	$13.75	$21.30	$44.38	$44.92	$44.50	$54.00	$11.60	$12.45	$16.80	$20.25
20-Year Equipment Cost③	14.02	22.11	45.14	46.00	47.80	57.60	13.34	14.70	21.00	26.25
	15,000 VOLTS									
Interrupting Ratings in amperes, rms, asymmetrical	2000	4000	4000	6000	8000	11,000	3900	3900	5900	7400
First Cost②	$16.95	$26.13	$47.46	$48.00	$47.50	$60.50	$12.95	$14.45	$18.80	$22.95
20-Year Equipment Cost③	17.22	26.94	48.22	49.08	50.80	64.40	15.05	17.75	23.75	30.15

① Costs computed from prices in effect September 1949, using maximum discount quantities.
② Includes mounting and fuse, fuse link, refill unit, or fuse unit.
③ First cost plus 20-year cost of re-fusing.

DESIGNED FOR

FULL COVERAGE

FULL COVERAGE FUSING IS: the **new concept of transformer fusing** in which a primary fuse is applied for **both** primary short circuit and secondary back-up short circuit protection.

FULL COVERAGE FUSING PROVIDES—in addition to primary short circuit and secondary back-up short circuit protection—savings in operating expense by:

(1) **Eliminating the need for replacement of "suspect" fuses, links, or refills on other phases when one fuse blows.**

(2) **Eliminating the need for periodic replacement of fuses, links, or refills to prevent "sneak-outs" caused by vibration- or age-weakened fusible elements.**

(3) **Eliminating "sneak-outs" caused by high current surges.**

FULL COVERAGE FUSING REQUIRES: dependable high and low fault-current interrupting ability; a fine degree of accuracy in time-current characteristics; a "non-damageable" fusible element which cannot be injured by surge currents, vibration, or aging, and a full range of speeds—standard, slow, and time-lag—to provide flexibility in coordinating with other primary, and with the secondary, protective devices.

OTHER BENEFITS YOU GET WITH S&C LIQUID POWER FUSES:

1. **Short Arcing Time**—Shortest of any power fuse or cutout.
2. **No Interference from Sleet or Glaze**—because drop out action not needed to prevent tracking or to indicate a blown fuse.
3. **All Low Fault Currents Cleared**—unlike expulsion type devices, Liquid Fuses clear **all** types of low fault currents dependably.
4. **Stable Time-Current Characteristics**—achieved through S&C "Non-Damageable Fusible Element Construction", permit close, permanent, coordination; and eliminate "sneak-outs" (unnecessary outages).
5. **Fire Hazard Minimized**—no hot metal ejected to cause grass or underbrush fires.

S&C ELECTRIC

Formerly SCHWEITZER & CONRAD, INC.

H. J. Randolph Co., Los Angeles; Geo. E.

longer afford to gamble on— cutouts to protect investment and service continuity where high fault currents are possible?

NEW SIMPLIFIED MOUNTING FOR S&C LIQUID POWER FUSES

One reason for the low prices of this fuse and mounting combination is the new Simplified Mounting. As shown by the illustration, it is smaller and lighter than other type mountings. Yet streamlining has actually improved its insulation values by increasing leakage distances and flashover characteristics. In fact, its insulation values greatly exceed NEMA Standards for cutouts, and equal NEMA Standards for switch and bus insulators.

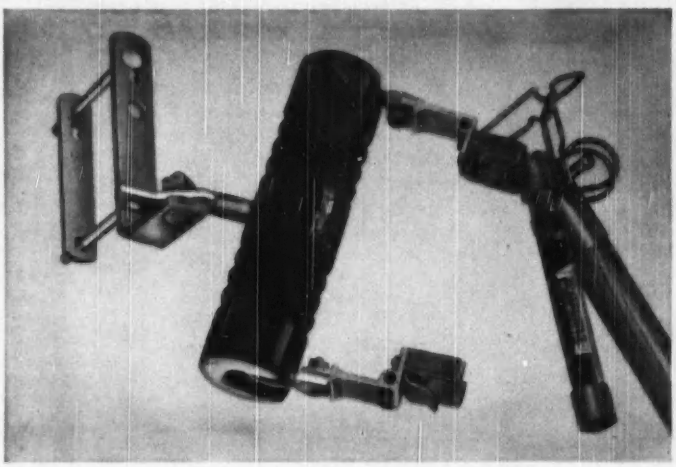
Its first cost is lower. Its installation costs are lower.

It is bird- and animal-proof because the mounting bracket is located on the opposite side of the insulator from the live parts.

A NEMA Standard hanger and adjustable mounting bracket provide exceptional flexibility in positioning on cross arm, pole, or structure.

New fuse clips provide easy fuse handling with any ordinary hook stick.

Write today for full information given in new Catalog Section 223.



7,500-volt, 20E-ampere, Size 2 Liquid Power Fuse and Simplified Mounting. Total cost of mounting, hanger, fuse and clips—$12.45. Interrupting rating—4500 amperes.

NEW NON-EXCHANGE PLAN FOR PURCHASE OF S&C LIQUID POWER FUSES

Another reason for the low prices of this new fuse and mounting combination is the reduction in costs made possible by the elimination of factory refilling of S&C Liquid Fuses. This can be done now under an alternative purchasing arrangement known as the Non-Exchange Plan.

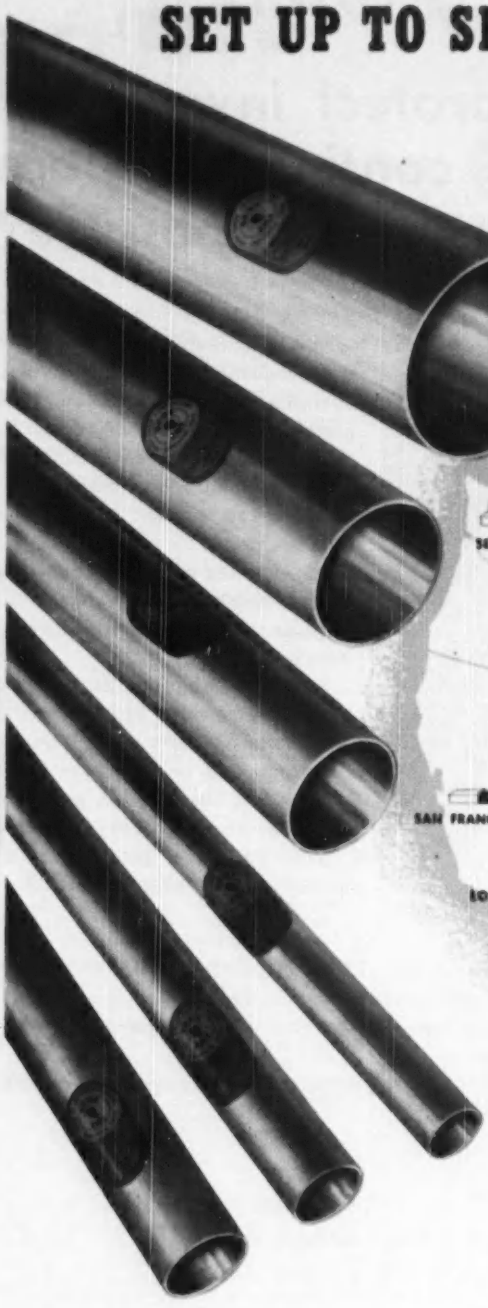
This plan will be a money saver for most users of type B, COR, and D Liquid Fuses (of any voltage or size). Ask your S&C Representative for details, or write the factory.

COMPANY 4425 Ravenswood Avenue
Chicago 40, Illinois, U. S. A.

IN CANADA Powerlite DEVICES LIMITED, TORONTO •

Honn Co., San Francisco; Chas. E. Klaus, Portland; Thomas S. Wood, Seattle

SET UP TO SERVE YOU QUICKER



7 STRATEGIC WAREHOUSING POINTS FOR ROME-EMT...

It Costs Less to Buy the Best...
Buy Rome-EMT

Approved by Underwriters' Laboratories, Inc.

ALL OVER THE WEST AND SOUTHWEST

WITH Rome • EMT

THE *BETTER* ELECTRIC METALLIC TUBING

When you specify ROME•EMT you are not only buying a high quality thin wall conduit, but are assured, as well, of a warehousing set up that provides prompt delivery. Supplementing wholesalers' stocks, there are seven strategically located Rome Cable warehouses carrying a full range of ROME•EMT sizes, backed by adequate and modern manufacturing facilities at Torrance, California.

It will pay you to standardize on ROME•EMT for several reasons. First, it is lighter, more economical and easier to handle than heavier types of raceway materials. Further, manufactured on the most modern equipment available, it is uniformly accurate in diameter and wall thickness. Electro-galvanized, ROME•EMT has a uniform outer protection against corrosion, while a clear, mirror-smooth inside enamel finish makes pulling easy. Finally, ROME•EMT has been recognized as establishing a new *standard of quality* in electrical metallic tubing.

ROME•EMT is available in ½", ¾", 1", 1¼", 1½" and 2". Get it from your electrical wholesaler, or call your nearest Rome Cable office today.

For unexcelled cable performance:

RoZone
RoMarine
RoPrene
RoLene
RoFlex
RoBarn
Rome Synthinel®

Remember these names for dependable quality.

Completely balanced stocks of ROME•EMT are maintained at all points for prompt shipment.

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Corporation
TORRANCE, CALIFORNIA

PACIFIC COAST SALES OFFICES

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SAN FRANCISCO 3, CALIF.
144 Townsend Street

SEATTLE 4, WASH.
3404 Fourth Ave., So.

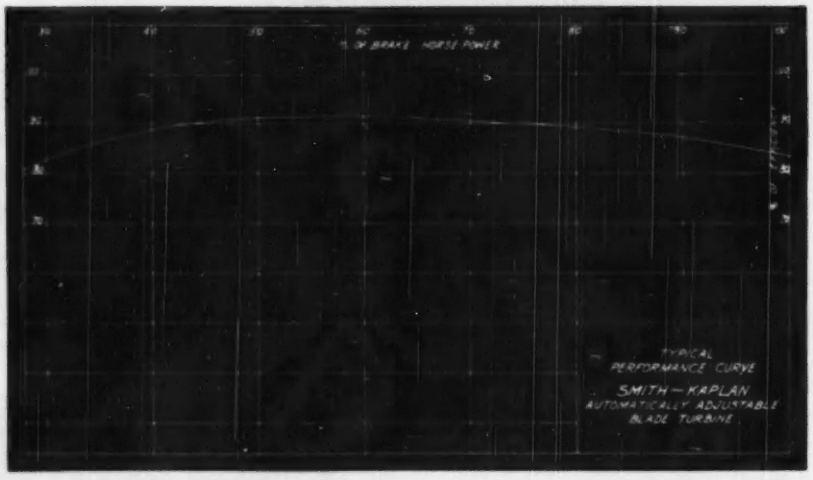
The SMITH-KAPLAN TURBINE

PROOF of value! - ten of these 75,000 Hp. units installed at Bonneville!

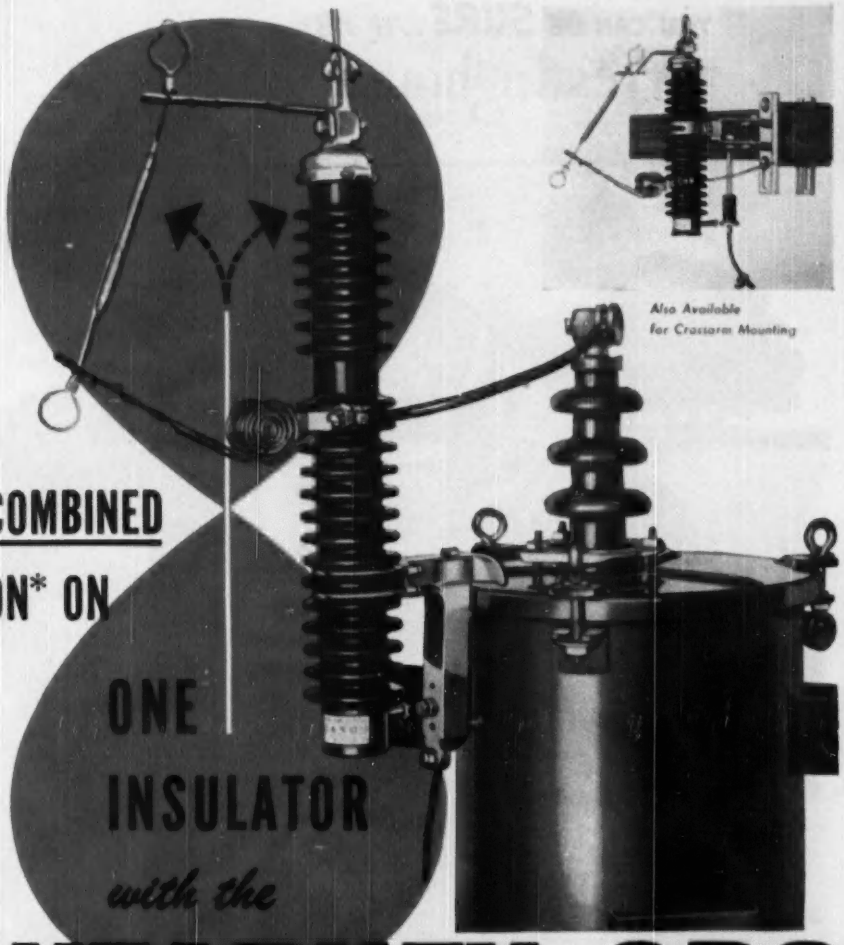
The Smith-Kaplan Turbine affords users high efficiency over a wide range of load, as a study of the accompanying Graph will reveal. Write for data.

If It's Hydraulics - Put It Up to Us!

S·MORGAN SMITH COMPANY
·YORK·PENNSYLVANIA·U·S·A·



POWER *by* SMITH



Also Available
for Crossarm Mounting

YOU GET COMBINED PROTECTION* ON ONE INSULATOR *with the*

KEARNEY QRC

(Combined Fuse Cutout and Lightning Arrester)

*Full lightning, overload and short-circuit protection on *one insulator* enables you to modernize your present transformer protection for only $17.22. And with the high surge capacity Type X fuse you get an added protection . . . against excess outages.

MAYDWELL & HARTZELL West Coast Distributor:

Protect your transformer investment the modern way—write today for complete technical data.

JAMES R. KEARNEY CORPORATION
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Canadian Plant: Guelph, Ontario

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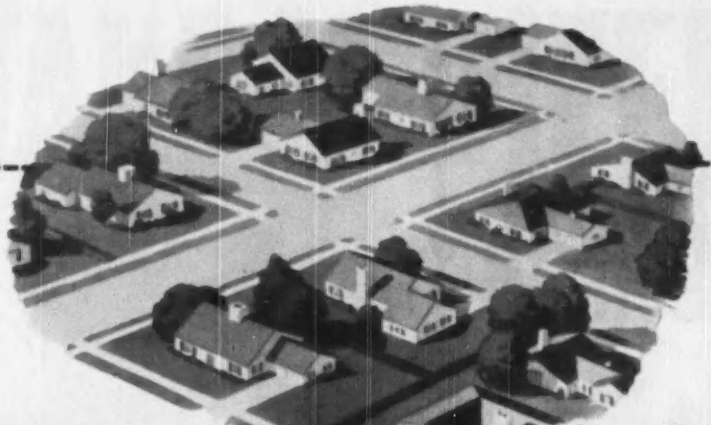
Better Construction—*SAFER* Maintenance

YOU CAN BE **SURE**.. IF IT'S
Westinghouse



Johnny's "Short Cut" takes 3,000 kilowatts now!

. . . just an old field on the edge of town. A few years ago, Johnny saved ten minutes getting home. Now his favorite short cut proudly displays 400 new homes.

Are you prepared to economically handle this new load?

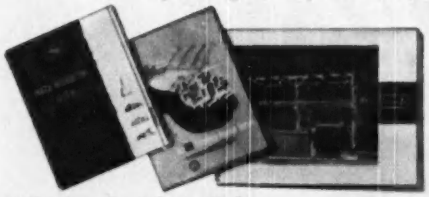
Sure, it's difficult to predict such future loads . . . BUT you can *plan* for them! For the first time in a good many years, you have a *real* opportunity to rebuild and simplify your system.

This doesn't mean you have to scrap your present equipment. It does mean that replacements and extensions should be made with a *modern system plan* in mind. Its flexibility meets *future* requirements. System planning actually means *less equipment* . . . but *better co-ordinated equipment.*

How can Westinghouse help you in this problem?

We can assist you in your *system planning.* Our engineers have worked with utility engineers throughout the country. Together, we have solved power distribution problems of all kinds and we have learned to *plan* systems and co-ordinate *all* distribution apparatus.

Our complete facilities . . . engineers, calculating boards, service organization . . . are all available to help *you.* May we be of help in your *system planning?* Call your nearest Westinghouse office or write Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa. J-97138



YOUR "Know-How" Put to Work

One of the many ways in which Westinghouse can help you in your problem is to crystallize and formulate the best thinking on *system planning.* Here are three outstanding books to help you:

"Electric Utility Power Distribution Systems", B-3905—explains and classifies typical systems for *all* types of areas.

"Co-ordinated Substations", B-4061—presents a complete standardized line of substations, designed and manufactured to answer any *system* requirement.

"A-C Secondary Network Systems", B-4002—is the complete story of a system that has saved the utilities at least $175,000,000.

ASK FOR A PRESENTATION OF THIS VALUABLE INFORMATION

Westinghouse

Coming!

Revolutionary development that will ROCK the INDUSTRY

FEDERAL NOARK

Federal Electric Products Company, 50 Paris Street, Newark 5, N. J.

STANDARDIZED to Save You Time, Money!

ALLIS-CHALMERS Standard Type "O" Oil Circuit Breaker

FOR SYSTEMS UP TO 23 KV, UP TO 250,000 KVA INTERRUPTING CAPACITY

- Complete Automatic Reclosing
- Factory Assembled and Wired
- Standard Protective Relay Equipment
- Ready to Install and Operate

YOU'LL SAVE TIME AND MONEY with standardized, completely packaged Type "O" protection. Standardization is your assurance of proved design . . . saves you time in ordering . . . shortens delivery . . . reduces installation time . . . means greater economy passed along to you in dollar savings!

Type "O" outdoor oil circuit breakers clear faults fast. When breaker is tripped, full mechanically and electrically trip-free operating mechanisms release contacts *immediately* under all conditions. Fault or overload currents are cleared within 8 cycles . . . breaker opens and recloses within 30 cycles when connected for automatic reclosing. ASA standard ratings in 7.2, 14.4 and 23 kv sizes.

Get more facts about Type "O" or other breakers from your nearby A-C sales office. Or write for bulletins.

Type OZ-210, 3 pole, 15 kv, 600 amp Outdoor Oil Circuit Breakers installed in Middle-West.

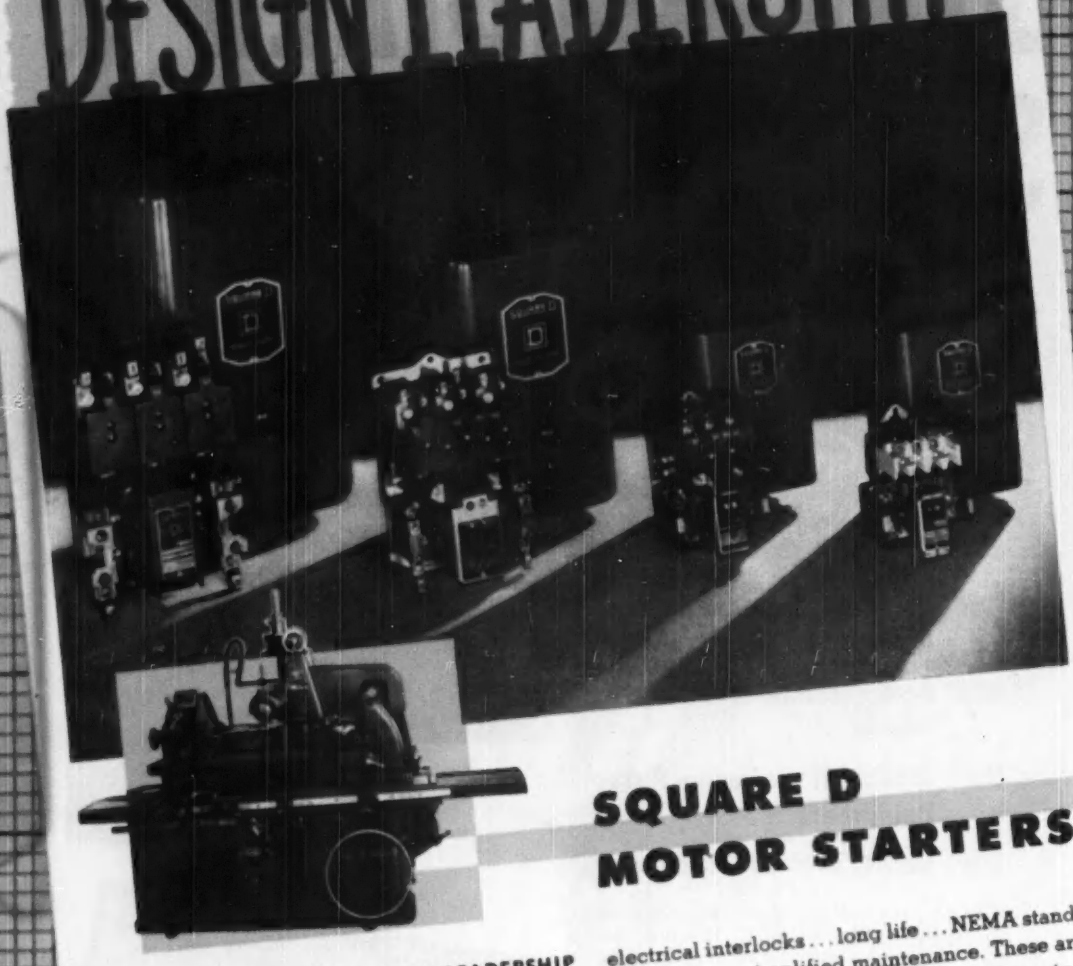
ALLIS-CHALMERS, 939A SO. 70 ST. MILWAUKEE, WIS.

ALLIS-CHALMERS

Building Fine Power Circuit Breakers Since 1899

A-2875

DESIGN LEADERSHIP



SQUARE D MOTOR STARTERS

SQUARE D's DESIGN LEADERSHIP is reflected in important features: Generous wiring space . . . simple contact change . . . easy coil removal . . . additional electrical interlocks . . . long life . . . NEMA standardization . . . simplified maintenance. These are features which add up to an ever-increasing preference for Square D motor starters.

Write for BULLETIN 8536

Square D Company, 4335 Valley Blvd., Los Angeles 32, California

SQUARE D COMPANY

DETROIT · MILWAUKEE · LOS ANGELES

SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

FOR ELECTRICAL &

GENERAL PURPOSE JOBS

● Security Tape will never let you down. Its adhesive compound is not just sticky, but strong and rubbery. To handle tougher jobs, the fabric is unusually high in tensile strength. Security has no pinholes to cause leaks. Straight-tearing, non-ravelling.

ASK YOUR WHOLESALER FOR SECURITY

A QUALITY PRODUCT OF

U.S. RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

WHAT! ME BID HIGH ON A JOB?
H. JONES ELECTRICAL CONTRACTING CO., INC.
SURE. DOYLE SMITH, OVER IN RIVERVILLE DID. GOT IT, TOO!
BY BIDDING HIGH? HOW?
HE WAS WIRING A HOUSE IN RIVERVILLE.....
YES, MRS. JOHNSON, WE'LL PUT EXTRA OUTLETS JUST WHERE YOU'VE SHOWN ME. NOW I KNOW YOU'LL WANT THE BEST IN PROTECTION, TOO
WHAT DO YOU MEAN?
WHY PUT UP WITH OLD-FASHIONED FUSES ANY LONGER? YOU'LL LIKE CIRCUIT BREAKERS BETTER IN EVERY WAY!
OUR NEW CAR HAS 'EM, INSTEAD OF FUSES
NO FUSES?
DOYLE SMITH ELECTRICAL CONTRACTING
RIGHT! INSTEAD OF BLOWING A FUSE, A SHORT CIRCUIT TRIPS A BREAKER. WHY FUMBLE AROUND WITH FUSES IN THE DARK? JUST FIX THE SHORT AND FLIP THIS SWITCH!
WONDERFUL! I'M SIMPLY TERRIFIED OVER CHANGING FUSES!
BUT WON'T HARMLESS LITTLE OVERLOADS....LIKE STARTING THE WASHING MACHINE....TRIP CIRCUIT BREAKERS?
NO. HYDRAULIC PLUNGERS IN THESE MURRAY MAGNETIC BREAKERS LET THEM CARRY TEMPORARY OVERLOADS....YET SHORT CIRCUITS TRIP THEM INSTANTLY!
DON'T THEY COST A LOT?
NOT AT ALL. ON YOUR JOB A CIRCUIT BREAKER LOAD CENTER, LIKE THIS, WOULD ADD LESS THAN $15 TO THE COST
YOU'VE SOLD ME! I'VE ALWAYS WANTED MODERN CIRCUIT BREAKERS, BUT FIGURED THEY COST A FORTUNE
NO...THEY'RE ONE OF THE SOUNDEST VALUES YOU CAN BUILD INTO YOUR NEW HOME
DOYLE SMITH ELECTRICAL CONTRACTING
NO MORE OLD FUSES BLOWING!

WHEN CUSTOMERS DON'T KNOW ONE BREAKER FROM ANOTHER, SMITTY SHOWS 'EM HOW MUCH BETTER BREAKERS ARE THAN FUSES
MIGHT WORK WITH HOME BUYERS, BUT LOTS OF MY JOBS COME THROUGH ARCHITECTS OR BUILDERS... AND THEY'RE SOUR ON BREAKERS BECAUSE HEAT TRIPS THEM
THEN TELL THEM ABOUT MURRAY FULLY MAGNETIC BREAKERS! THEY DON'T HAVE ANY THERMAL ELEMENTS, SO THEY'RE NOT AFFECTED BY HEAT!
NO THERMAL ELEMENT! HOW DO THEY WORK?
LOOK.... MAGNETISM TRIPS THE BREAKER. MAGNETISM DEPENDS ONLY ON CURRENT. HEAT HAS NOTHING TO DO WITH IT. AND THE HYDRAULIC PLUNGER GIVES TIME DELAY
THEN EVEN IN WARM PANELS, MURRAY BREAKERS SHOULDN'T TRIP LOW. DO THEY TRIP FAST ON SHORTS?
DO THEY! THIS LITTLE RIG PROVES IT. I SHORT THIS MURRAY BREAKER WITH FINE WIRE.... AND CLOSE THE SWITCH
CLICK!
NOTHING HAPPENED
NOT TO THE WIRE, BUT THE MURRAY BREAKER TRIPPED. NOW WE'LL PUT IN THIS THERMAL BREAKER...OR A THERMAL MAGNETIC...RIGHT OUT OF YOUR OWN STOCK. STAND BACK....
FLASH!
WOW!
SOME PROTECTION! THE WIRES MELT YET YOUR SLUGGISH THERMAL BREAKER STAYS SERENELY SHUT!
NOW WE'LL FEED 15 AMPS. THROUGH YOUR THERMAL BREAKER AND PUT IT HERE IN THE SUN
NOW I CAN TELL YOU WHAT'S GOING TO HAPPEN
NO, THERMALS WON'T CARRY RATED LOAD LONG IN A WARM SPOT. MURRAY FULLY MAGNETICS WILL CARRY IT ALL DAY!
CLICK!
THEN I WON'T HAVE TO DERATE MURRAY BREAKERS!
RIGHT! NO DERATING! NO FALSE TRIPPING! THAT'S WHY MURRAY FULLY MAGNETIC BREAKERS ARE IDEAL FOR YOUR APARTMENT HOUSE JOB!
SOUNDS GOOD. BUT I'LL HAVE TO SELL THE ARCHITECT. THOSE FOLDERS WILL HELP A LOT
HAVE A HANDFUL. AND IF I CAN HELP WITH A DEMONSTRATION ANY TIME....PARTICULARLY WITH THAT ARCHITECT....JUST CALL ME!
THANKS! I'M GOING TO START SELLING HIM ON MURRAY FULLY MAGNETIC BREAKERS RIGHT NOW!
YOU, TOO, can reap extra profits from the inherent advantages of Murray Fully Magnetic Circuit Breakers. ASK YOUR MURRAY REPRESENTATIVE FOR DEMONSTRATION!
Murray
Has NO Thermal Unit
This folder contains simple diagrams that explain to architects, electrical contractors and home owners just how Murray Fully Magnetic Breakers afford dependable circuit protection without unnecessary interruptions. Write for your Copies Today!
MANUFACTURING CORPORATION
50 Years of Service to the Electrical Industry
1250 ATLANTIC AVENUE · BROOKLYN 16, NEW YORK
SERVICE ENTRANCE & METER EQUIPMENT · MAGNETIC CIRCUIT BREAKERS
SWITCHES · CURRENT LIMITING REACTORS · CROWS'NEST AERIAL LADDERS

. . . its easier to *Sell*

. . . its easier to *Install*

the Curtis **STORE-LITER**

FOR EIGHT AND FOUR FOOT SLIMLINE LAMPS

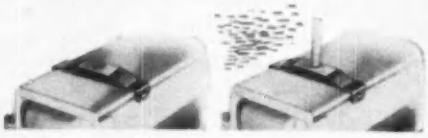
The Curtis "Store-Liter" enables you to offer the retail merchant a lighting unit which costs him less for installation . . . less for maintenance . . . and less for operation. It is designed to utilize, with highest efficiency, the many advantages of the new T-12, 96-inch slimline lamps.

High Transmission plastic side panels provide high levels of quality illumination on merchandise whether displayed on vertical racks or in horizontal cases. Selling qualities are easily seen . . . selection of merchandise is made easy for the customer.

Functional open design of this new luminaire provides for ease of maintenance. Relamping is accomplished without disturbing side panels. For thorough cleaning, side panels are easily disengaged in same manner as the lamps (push-pull principle). On your next retail store lighting job, recommend and install the Curtis "Store-Liter"...a profitable luminaire for you and your customer.

The new sliding clamp hanger makes installation of "Store-Liter" luminaire an economical pleasure.

Sliding clamp hangers are first secured to ceiling at desired locations. Completely assembled luminaires are then raised and fastened into clamps by tightening a single screw. Sliding clamp hanger also permits by-passing building construction obstacles, such as beams, sprinkler heads, etc.



Full technical details and specifications on the STORE-LITER are illustrated and described in Bulletin Four. Write today for your copy to supplement your Curtis Catalog.

WITH THE CURTIS MAN

Plan *Lighting*

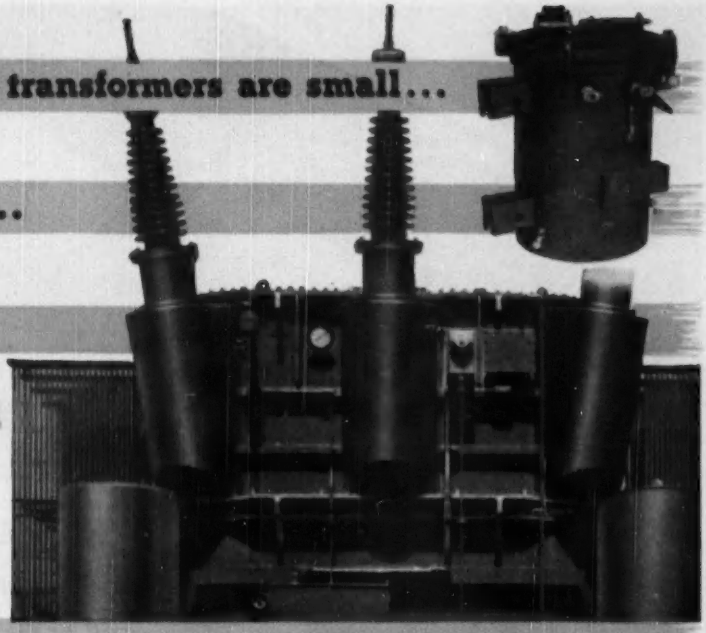
CURTIS

LIGHTING, INC., 6135 W. 65TH ST., CHICAGO 38, ILLINOIS

Whether your transformers are small...

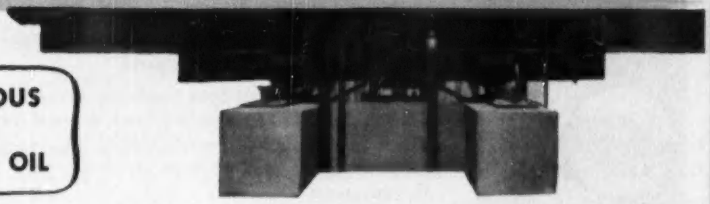
or large...

old or new...



You'll save on operating costs with

SHELL DIALA OIL A X



IT'S THE FAMOUS 50-YEAR TRANSFORMER OIL

Four years ago Shell brought out Diala Oil AX, a new, inhibited transformer oil. Because of its performance in laboratory accelerated tests, it appeared to be the long-sought answer to *oxidation*—number-one enemy of transformer oils. (Oxidation causes sludge.)

In later full-scale tests, made in transformers overloaded beyond limits ever exceeded in actual operation, Shell Diala Oil AX resisted oxidation so effectively that its *service life* was reasoned to be *five* or more *times* the life of conventional oil under comparable conditions . . . even *50 years* or more in open, air-breathing transformers.

Now, four years later, evidence keeps coming in to show Diala Oil AX is performing as predicted...

IN ACTUAL USE—Under the most severe operating conditions, Shell Diala Oil AX after four years' service is still in "like new" condition. In the same installations, conventional oils deteriorated badly in half the time.

IN INDEPENDENT TESTS—Power companies have run accelerated tests on Shell Diala Oil AX in their own equipment. Every single one of these independent tests confirms Shell's own findings.

Saves money—and then some!

Frequent oil changes, frequent purification, transformer overhauls, oil protection devices—all those expenses in transformer maintenance can be minimized when you use Shell Diala Oil AX. No matter what other kind of oil you're using in your transformers now—no matter if they're large or small, old or new—you'll save money by switching to Shell Diala Oil AX.

AND IT'S THE IDEAL OIL FOR VOLTAGE REGULATORS AND OIL-FILLED BUSHINGS

SHELL

Also recommended for circuit breakers and oil-filled switches

What is the Difference?
These boxes are of different makes, yet they are as much alike as two peas in a pod. It is doubtful if an experienced electrical craftsman or even the makers of the boxes could identify them.
So it is with certain other common types of electrical boxes and conduit fittings.
But a BIG difference will be found when entire LINES of boxes and fittings are compared.
It will be found that Steel City's line is not limited to easy to make items, items in greatest demand, or which show a better profit. It is a COMPLETE line of boxes and fittings, constantly kept up to date with wiring requirements.
In switch boxes, outlet boxes and covers and conduit fittings . . .
Steel City Leads
In Meeting Contractors' Needs
STEEL CITY ELECTRIC COMPANY
2207 E COLUMBUS AVENUE PITTSBURGH 12 PENNA

Why ANACONDA Thermoplastic Street Lighting Cable is Safer

For public safety (and good will) street lighting service must not fail. ANACONDA Thermoplastic Street Lighting Cable is:

Safer because it is stubbornly resistant to sun and weather when overhead...

Safer because it is ruggedly resistant to earth acids and alkalies when buried...

Safer because its tough hide resists abrasion and cutting when pulled into duct...

Safer because it is moisture-resistant and flame-retardant.

ANACONDA Thermoplastic Street Lighting Cable is available insulated with either Densheath* (vinyl resin) or polyethylene for 3,000 and 5,000 volts; with or without lead sheath.

Polyethylene may be jacketed with tough, mechanically-protective Densheath, or with flame-retardant, non-combustible ANACONDA Type FR** Compound. The latter has superior insulating properties. For complete information get in touch with your nearest Anaconda Sales Office or Anaconda distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Reg. U. S. Pat. Off. **Trademark

The right cable for the job ANACONDA® WIRE AND CABLE

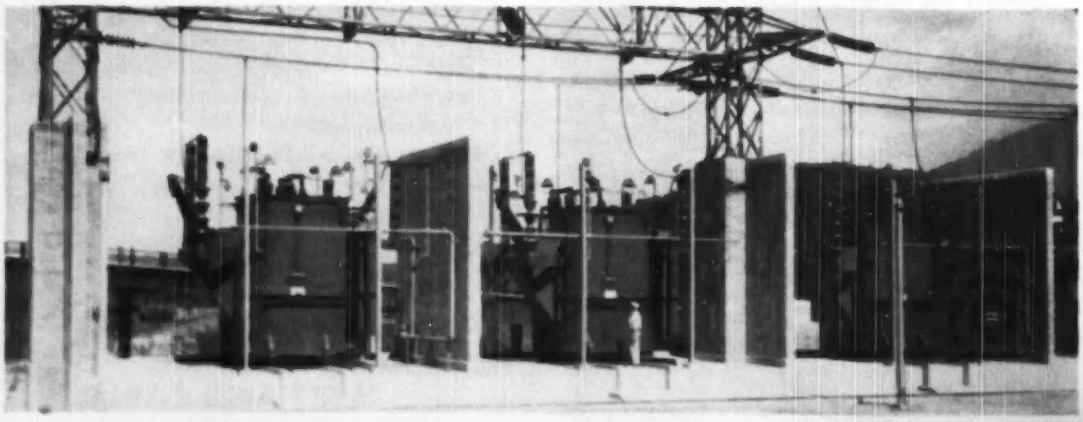
Confidence reduced the cost of this transformer 10%

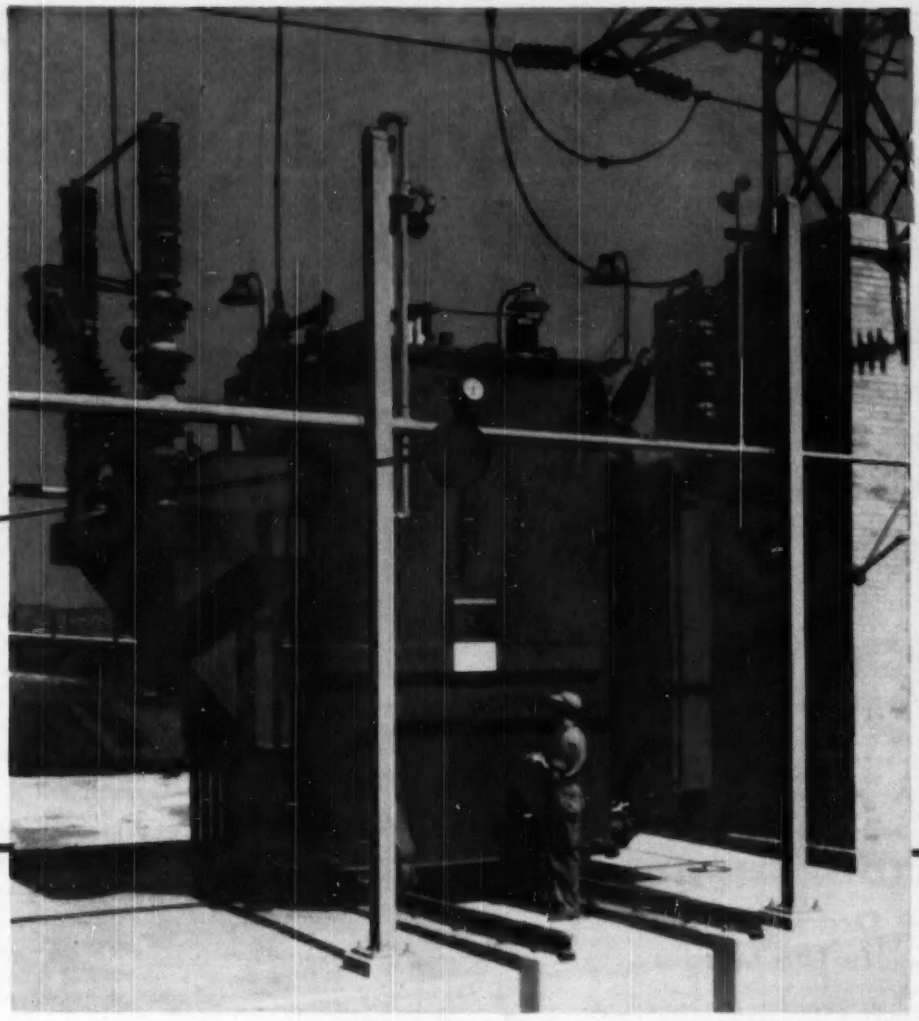
This transformer, and many others like it, stand as testimony to confidence in modern protective devices and research—explained on the opposite page. Because of this confidence, it is lighter in weight, smaller in size. Its losses are less, its impedance lower—and it saved its purchaser 10 per cent in price.

Because high-voltage research helps solve such practical problems as this, General Electric has recently built a new and better high-voltage laboratory at its Pittsfield, Massachusetts, plant where transformers are made. This laboratory is larger, permits more exacting tests on transformers and lightning arresters, and at voltages as high as 15 million volts. It is a research and engineering tool that will be used to its fullest capacity on future transformer design and development work.

Here is one more good reason why you can put your confidence in General Electric.

Apparatus Dept., General Electric Company, Schenectady 5, New York.





This transformer, a close-up of one of the three at the left is in service at the Tidd Station of The Ohio Power Company near Brilliant, Ohio. It operates at 138,000 volts, but is insulated in accordance with 115,000-volt insulation levels.

The story behind it goes back almost 20 years—to other transformers designed to specifications suggested by the American Gas and Electric Service Corporation. The basic idea was simply this—insulation levels are dictated by the impulse voltages that can reach windings. Limit those impulse voltages, by better design and placement of arresters, and insulation can be lowered. In other words, treat arresters as an integral part of the "insulation system" of a transformer, and you often will save on overall cost.

This was a theory. High-voltage research proved it to be a fact. The transformers for American Gas were built with an insulation level one step lower than had ever proved practical before.

These transformers—and many others like them have followed. Lowering insulation one step on transformers saves purchasers 10 to 12 per cent wherever circuit conditions permit their installation.

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

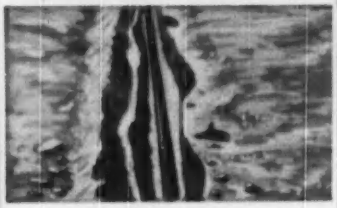
ORANGEBURG
Fibre Conduit News

MORE BUSINESS—MORE PROFITS FOR THE CONTRACTOR

VOL. 1 NO. 1 MARCH 1950 ★★★★★

MORE INSTALLATIONS IN 1950

Nocrete Saves Time Work and Money on Installations Like These



FIELD REPORTS point to Orangeburg *Nocrete* (Type 2) as the ideal conduit for single or double duct runs. Made with heavier walls for use *without* concrete encasement, *Nocrete* does a good, economical job for one or two duct installations such as factories, schools, colleges, hospitals, drive-in theaters, power, telephone and other communications systems, also service entrance, parkway and suburban lighting, airport boundary lighting.

Why Orangeburg Is The Leader

Orangeburg's experience in the fibre conduit field goes back 57 years. Since 1893, leading public utilities have used Orangeburg Conduit to protect cables underground. Today, Orangeburg is a predominating choice of utilities and municipalities—and of practically all design engineers.

Further investigation shows that Orangeburg has innovated *all* the important advancements of the fibre conduit industry. It is known as a company that stands back of its product—another reason why many consider it the fibre conduit to use—why Orangeburg is the established leader—the conduit to install for *lifetime* cable protection.

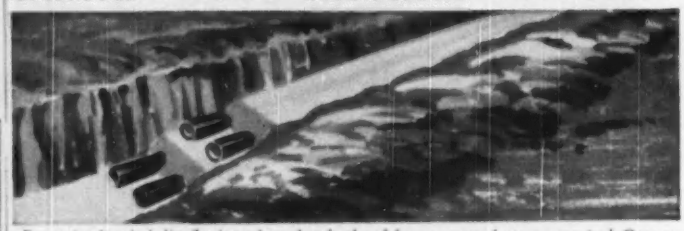
NO ELECTROLYSIS

Vital cables need permanent protection from stray currents, electrolytic action and chemical corrosion. Orangeburg Conduit—with its non-conducting properties, impermeable walls and tight joints—gives cables this protection.

DISTRIBUTED BY

GraybaR
ELECTRIC COMPANY

GOING IN THE GROUND TO STAY!



For main electrical distribution where duct banks of four or more ducts are required, Orangeburg *Standard* (Type 1) is the *preferred* conduit all over America. It is installed *with* concrete encasement—the method of installation employed by big users when putting transmission lines under ground to stay.

HIGHEST STANDARDS OF MATERIALS AND WORKMANSHIP

A trip through the Orangeburg plant shows quality standing out everywhere. You see there conduit being built for *permanence* in America's most modern and completely equipped factory—by craftsmen of exceptional skill and experience. You see why conduit, made Orangeburg's way, can give lifelong protection to cables underground—because it is non-corrosive and water-tight—because of its resistance to corrosive ground waters, its low breakage and minimum pulling friction.

First Cost is the Last Cost

In the experience of utilities, municipalities, railroads and other big users, initial and installed costs run lower when Orangeburg Conduit is used. For one reason, it permits longer runs. A second reason is its light weight and ease of installation. A third, the elimination of maintenance and repair costs. After half a century, many Orangeburg installations are still in active use, and when inspected prove to be as good as new.

WITHSTANDS HEAVY LOADS AND SOIL SETTLEMENTS

Orangeburg's unique materials have the toughness and resiliency to bear up under traffic shocks, sudden soil settlements or heavy loads without damage.

NOW BRANDED WITH ORANGEBURG TRADEMARK

Withstands Ground Acids and Alkalies

Orangeburg Conduit lines—dug up after 40 years—show no signs of deterioration from acids, alkalies, salt, grease or oil.

MORE BUSINESS IN 1950

To assure more installations in 1950, more Orangeburg Conduit is available at more distribution points through Graybar Electric Company and General Electric Supply Corporation. Electrical Contractors can therefore be surer of getting Orangeburg Fibre Conduit whenever they need it. Better product identity is another feature. The Orangeburg name is now branded on every length of Orangeburg for people to see.

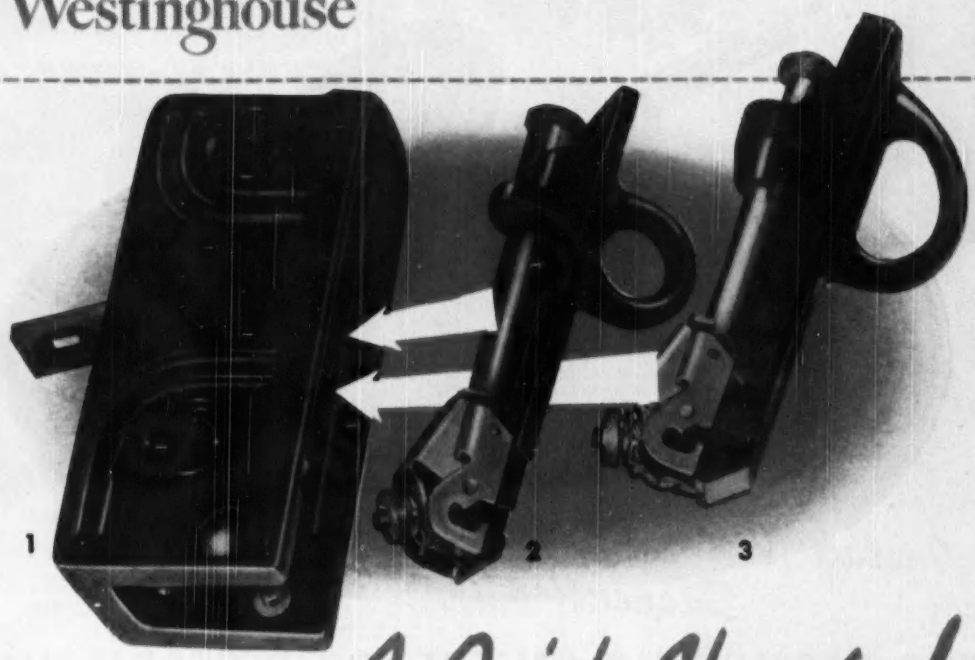
More push behind the product. Extensive, year-round advertising and promotion are telling the world the whole story about the advantages of Orangeburg . . . the *lifetime* conduit . . . the *leader* and *first* choice in every city and state in the Union.

DISTRIBUTED BY

GENERAL ELECTRIC
SUPPLY CORPORATION

ORANGEBURG MANUFACTURING CO., INC., ORANGEBURG, NEW YORK

YOU CAN BE SURE.. IF IT'S
Westinghouse



A Quick Changer!

...for fast re-fusing..for higher capacity

Interchangeability keynotes Westinghouse porcelain-enclosed cutouts. Only Westinghouse gives you this versatility in line protection. Consider what this means:

First, fuse replacements are fast . . . safe . . . easy. Lineman removes door with hookstick—replaces it with a fused door. Fuse links can be replaced at the truck or in the shop.

Second, as line capacity outgrows the cutout interrupting rating, the EA cutout door may be replaced with the new Type HC (high interrupting capacity) door—either dropout or non-dropout type. That's because *any* door will fit *any* housing.

In addition, you get greater safety; complete hookstick operation; 180° dropout for clear indication of blown fuse; cool operation; light weight combined with great mechanical and electrical strength.

These cutouts are available now in a range of sizes to meet your requirements. See the versatility of this cutout. Ask your nearby Westinghouse representative or distributor for a personal demonstration and Booklets B-3833 and B-4299. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-60705

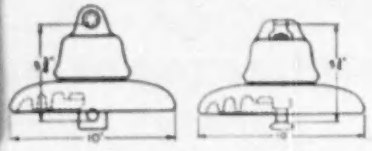
1. **PRESTITE PORCELAIN HOUSING**—50-ampere, 5-kv, identical for both Type EA and Type HC cutouts.
2. **MOLDARTA TYPE EA DOOR**—1,200-ampere interrupting capacity.
3. **MOLDARTA TYPE HC DOOR**—Interchangeable with Type EA cutout door. Interrupting capacity 8,000 amperes at 2,500 volts, 5,000 amperes at 5,000 volts.

Westinghouse
FUSE CUTOUTS
FOR ANY SYSTEM

ANOTHER VICTOR INSULATOR THAT SAVES AS IT SERVES
Left: Installing Victor suspension insulators on a power line in the Southwest

Install Victor Suspension Insulators

FOR DEPENDABLE ON-THE-JOB PERFORMANCE



No. 800 Clevis type

No. 900 Ball and socket type

VICTOR No.		800 and 900
60 cycle dry flashover	KV	80
60 cycle wet flashover	KV	50
Pos. impulse flashover	KV	125
Neg. impulse flashover	KV	130
Dry arcing distance	In.	7⅝
Leakage distance	In.	11½
Impact rating	In. Lbs.	55
M. and E. strength	Lbs.	15000

CONTINUOUS, trouble-free insulator service *counts* when it comes to *lower* maintenance and replacement costs on transmission lines. That's why more and more successful power companies are *specifying* Victor suspension insulators.

Even under the most severe service conditions, you can rely on Victor's rugged suspension insulators for years of uninterrupted transmission. *Each* one is rigidly inspected and tested at *every* point of manufacture, and must *easily* meet *all* NEMA standards. For you this means dependable performance *on the job!*

Get All the Facts!

REPRESENTATIVES IN THE FOLLOWING WESTERN CITIES:

Los Angeles, Cal. — Seattle, Wash. — Salt Lake City, Utah
San Francisco, Cal. — Spokane, Wash. — Denver, Colo.
Portland, Ore. — Boise, Idaho — Phoenix, Ariz.

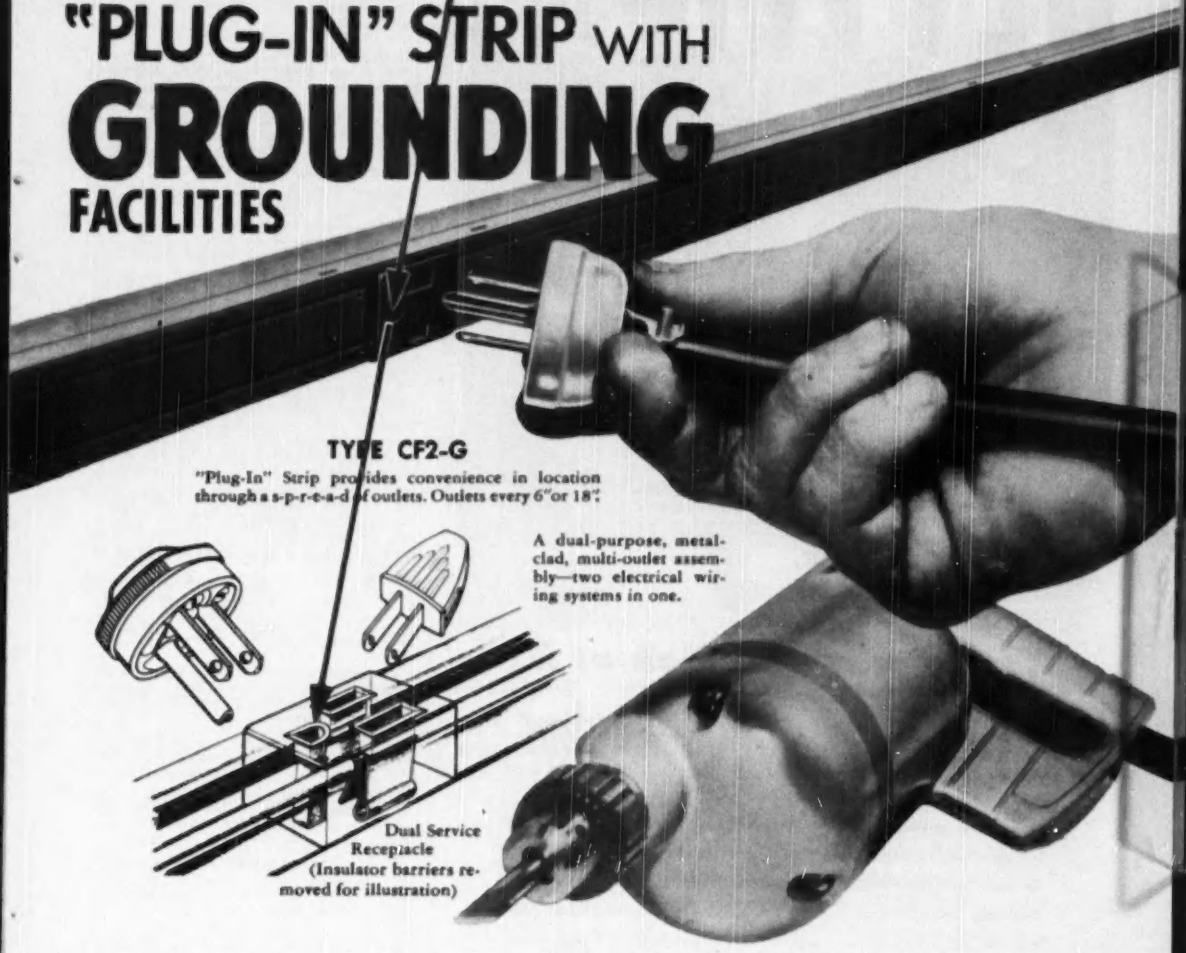
VICTOR INSULATORS Inc.
VICTOR, NEW YORK

Look for this trade mark of enduring service

V

READY NOW

"PLUG-IN" STRIP WITH GROUNDING FACILITIES



TYPE CF2-G

"Plug-In" Strip provides convenience in location through a s-p-r-e-a-d of outlets. Outlets every 6" or 18".

A dual-purpose, metal-clad, multi-outlet assembly—two electrical wiring systems in one.

Dual Service Receptacle (Insulator barriers removed for illustration)

Type CF2-G Grounding "Plug-In" Strip permits use of grounded or ungrounded devices *from the same outlet* . . . Will take either the new *Series 5200* 3-blade grounding plug or the standard 2-blade ungrounded plug.

STEEL FOR PERMANENCE

GROUNDED FOR SAFETY

Listed by Underwriters' Laboratories, Inc.

UNLIMITED APPLICATIONS . . . in FACTORIES . . . OFFICES . . . STORES . . . HOMES . . . HOTELS . . . APARTMENTS . . . SCHOOLS . . . HOSPITALS . . . INSTITUTIONS . . . "Plug-In" Strip is a professional material. Consult your electrical contractor for installation. *Grounding* "Plug-In" Strip meets contemplated revisions in the National Electrical Code covering grounded electrical systems. Type CF2-G Grounding "Plug-In" Strip is the quickest and easiest method of meeting grounding requirements. Write for our *free* folder "Grounding Plug-In Strip."

Everything in wiring points to NE

National Electric

PRODUCTS CORPORATION

1308 CHAMBER OF COMMERCE BUILDING, PITTSBURGH 19, PENNSYLVANIA

BETTER . . .

. . . any way you look at it!

CHANCE STEEL 8-Way Cone Anchor . . .

Linemen or *Groundmen* like the Chance Steel Cone because it is light weight—easy to handle and the nut retainer makes it easy to install. *Foremen and Construction Superintendents* like it because rough treatment and heavy tamping won't break it. They save on installation time and get a good solid job. Lighter weight, plus the fact that it stacks well makes the Steel Cone a favorite with *Storekeepers*. *Engineers* specify it because they can depend on steel and because the 8 flat wedging surfaces and the flaring base mean greater holding power. *Purchasing Agents* prefer it because they get all these advantages for less money—solid reasons for economy-minded *Management* men who demand lasting performance. Yes, *any way you look at it*, the Chance 8-Way Steel Cone is the best Cone Anchor buy on the market.

ABC INSULATORS

You know it's RIGHT . . .

LETTERS TO THE EDITOR

To The Editor:

I read with much interest the article entitled *Whose Water Is It* which appeared in the January 1950 issue of ELECTRICAL WEST. The author of that article arranged and summarized the arguments that the folks here in Grand County, Colo. have been advancing since the Colorado-Big Thompson project was initiated.

Grand County, Colo., has within its boundaries the Western works of the Colorado-Big Thompson project and the western end of a portion of the project of the city of Denver. Agricultural interests have petitioned the federal district court to intervene in the action described in the article. Many have been damaged already, and all see the potential damage to their rights if the courts should throw past decisions out and decide that jurisdiction over water rights lies in the Federal Court.

I feel that your article, if it could be read by the folks in the county, would do a great deal of service in acquainting those people with the inherent danger involved. I would like, therefore, permission to cause the article to be reprinted in both weekly newspapers of the county. The Ski-Hi News and The Middle Park Times reach a good number of Grand County citizens, and I feel that a service will have been done them if that article is brought to their homes.

Duane L. Barnard
Granby, Colo.

To the Editor:

The January issue of the ELECTRICAL WEST arrived today and I have been taking a "quick" look. On page 96 I read the report of the B. C. Electrical Inspectors meeting.

The statement is made that this was the first inspectors convention ever held in Canada. This is very definitely an error and a greater error than the statement that was made at the meeting, for the statement that was made at that time was to the effect that it was the first to be held in Vancouver.

As I was in attendance at the meeting I tried to correct the statement at that time but the error "grew" in size since then. So back to the archives I went and I came up with the report of the Western Section meeting of 1947 which I found in the November issue of the News-Bulletin. This brief report was made by John E. Wise and the first paragraph reads as follows: "With memories of the 1927 meeting of the Western Association in Toronto and the 1939 meeting of the Western Section, IAEI, in Hamilton, Ontario, to stimulate their interest if that was needed, 502 members of the Western Section gathered for the 43rd annual meeting in Montreal, Quebec. Many members came on the special train from Chicago and reports indicate that this trip furnished a very pleasant get-together."

Then going further back in the records I came across the report of the fourth annual meeting of the Northwestern Section, IAEI. This is a pamphlet of 149 pages and relates a very interesting meeting that was held in the Oak Room of the Vancouver Hotel, Sept. 9, 10 and 11, 1929. So we can see that there have been several meetings of inspectors in Canada.

Reading the report of this meeting will bring back some very treasured memories to some of the old-timers. For the first one, we find that H. A. Patton was president of the section.

Acting-Mayor Dean and W. G. Murrin, president, B. C. Electric Railway, welcomed the inspectors and the reply was given by J. C. Forsyth, New York City, president of the International, and by L. W. Going, Portland.

The roll call gives a list of 148 names, 62 of these from Canada. Members introduced by President Patton were: J. C. Forsyth, L. W. Going, W. S. Boyd, Chicago; F. D. Weber, Portland; V. H. Tousley, Chicago; Harry B. Kirkland and W. J. Canada, NEMA, New York City; W. C. Cale, Ontario Hydro Commission, Toronto; C. W. Guftafson and James S. Mahan, Chicago; Dr. M. G. Lloyd, Bureau of Standards, Washington, D. C.; M. A. de Lew, San Francisco; Berkley Snow, ELECTRICAL WEST and W. C. (Bill) Mainwaring, chairman, local entertainment committee, Vancouver. Present at this meeting and still members of the IAEI are Bill Mainwaring and Meirion Davies.

I do not claim that this is a complete list of inspectors annual meetings held in Canada but it does show that the 1949 meeting was not the first, either in Canada or in Vancouver, and maybe there is a story in this or possibly it is of more interest to me than to other readers of ELECTRICAL WEST.

Reading over the report of this 1929 meeting has been most interesting and certainly brings back fond memories and the thought of companionship of members that have since been judged by the Chief Inspector of all of us.

Another name I notice in the roll call is Dana Pierce—E. G. S. Pryor is there and so it goes. Does it reach your heart strings too?

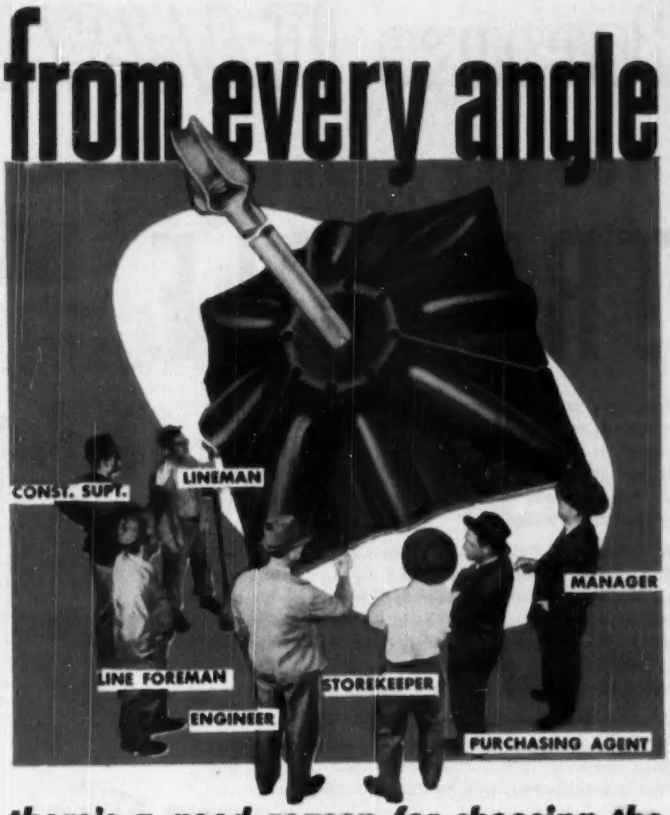
W. L. GAFFNEY,
Tacoma, Wash.

ELECTRICAL BOOKS

YARDSTICK FOR POWER, 93 pages, 6x9, published by Sangamo Electric Co., to mark the occasion of the company's fiftieth anniversary as manufacturers of electric meters. Great advances have been made in the metering art in the past fifty years, and Sangamo endeavors to sketch this progress against the background of an expanding electric utility industry and a growing nation.

SIMPLIFIED ELECTRICITY FOR UTILITY WORKERS, by P. R. Rutledge, ten units of 25 to 30 pages each, 8x10 ringbinder, Delmar Publishers Inc., Albany, N. Y., $10.20 per set. Produced by P. R. Rutledge, industrial engineering manager of the Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y. as a training course to meet the needs of non-technical employees of the electric utility industry and qualify them for the job ahead.

RESUSCITATION AFTER ELECTRIC SHOCK, by Charles F. Dalziel, professor of electrical engineering, University of California, 14-page pamphlet, 6x9, University of California Press, Berkeley, Calif., 10 cents. Covers rescue of the victim, prone pressure method, pole top method, mechanical resuscitators, treatment of shock or injury, necessity of continued care, and safety suggestions.



there's a good reason for choosing the

CHANCE STEEL 8-Way Expanding Anchor

Here's what the men who buy and use them say: *Linemen*—"We don't have so much weight to carry."—"It takes fewer licks to expand." *Foremen and Construction Superintendents*—"We do save some time and labor."—"There's no danger of breakage."—"We can tell when this anchor is expanded." *Storekeepers*—"They're easy to handle."—"Your colored identification tag is a big help." *Engineers*—"We can depend on the uniformity of steel."—"You've taken full advantage of all the area."—"Our tests show it has susprising strength."—"The cone shape is a good idea—you get a wedging action." *Purchasing Agents*—"Any time we can satisfy ourselves on quality at a price we like—we're happy." *Management*—"We've seen convincing proof that our lines are going to stay put with your 8-Way in the ground."... You get more for your money in the Chance 8-Way Expanding Anchor.

...when you specify CHANCE

A. B. CHANCE COMPANY—CENTRALIA, MO. SAN FRANCISCO, CALIF.

Because IT *MUST* BE RIGHT

You can count on

TRIANGLE

You can see for yourself that it takes massive machines to turn out lead covered and high voltage cables to meet today's rigid specifications. But machines alone cannot do the job: behind them must be men of many years' experience in making cable — in making it *right*.

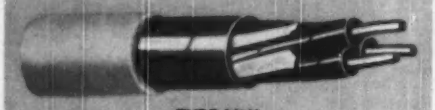
At Triangle's efficient New Brunswick plant you will find modern machines manned by true craftsmen, checked by rigorous inspection, backed by unceasing development and research. To you, this means the finest in parkway...power...varnished cambric ...lead covered cables that can be constructed — today's top value in wire and cable.

Whether your needs are for standard cables built to I.P.C.E.A. recommendations, or for special cables tailor made to your own specifications, you will find Triangle engineers glad to consult with you.

← **Protection Plus**—This huge press produces a smooth, uniform sheath of virgin lead for utmost cable protection.

TYPE RLJFJ

PARKWAY CABLE



TYPE VML

LEAD COVERED CABLE

TYPE V

VARNISHED CAMBRIC CABLE

The Trade Mark Of Top Value

TRIANGLE CONDUIT & CABLE CO., INC.

1904 JERSEY AVENUE • NEW BRUNSWICK, NEW JERSEY

"IT *MUST* BE RIGHT!"

Catalog No. 500 Gives Full Details Of The Complete Triangle Line

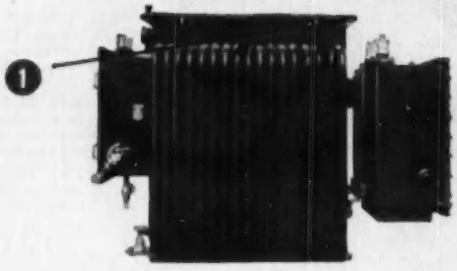
"Glazon" & "Triaseal" Building Wire • "Tricon" Control Wire • "Adaptal" General Purpose Wire • "Trilex" Non-Metallic Sheathed Cable • "Trioprene" Trench Cable • Service Entrance, Parkway, Power & Varnished Cambric Cables • "Tristeel" Flexible, Thin Wall & Rigid Steel Conduit

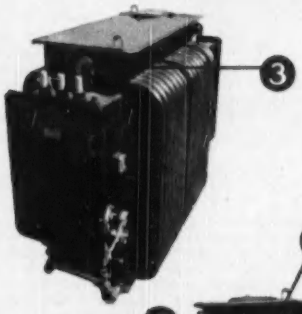
The a-c secondary network system is now recognized as *the* lowest-cost system for providing high-quality service to heavy load areas. While normally used for business sections of cities—50,000 or more in population—it will frequently pay its way in smaller towns as well.

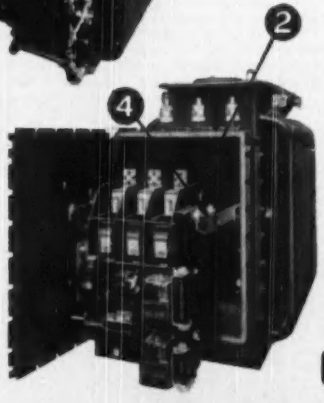
But—to realize the full savings possible with networks, you must use standardized network equipment. For example:

YOU SAVE ON MAINTENANCE when you specify

Standardized Network Equipment







1 MAJOR GASKETS ARE ELIMINATED by welding, not bolting, transformer cover and switchbox to the main unit. Locating the tap changer behind a pipe plug eliminates a packing gland around an external shaft.

2 BUSHINGS can be removed externally, without opening the main transformer tank.

3 ALL TRANSFORMER ACCESSORIES—liquid-level gages, thermometer, tap changer, and all valves—are located at the high-voltage end of the transformer, easy to get to and check.

4 NETWORK PROTECTOR can be slid out on rails for quick inspection. Relays plug in—can be easily removed and replaced for checking.

PLUS **FASTER DELIVERY**— G-E standardized network transformers and protectors can be supplied on shorter delivery.

LOWER PRICE— G-E standardized network units are appreciably lower in price than non-standard designs.

LOWER INSTALLATION COSTS—G-E standardized network units are designed for narrower, shallower vaults, saving substantially in vault-construction costs.

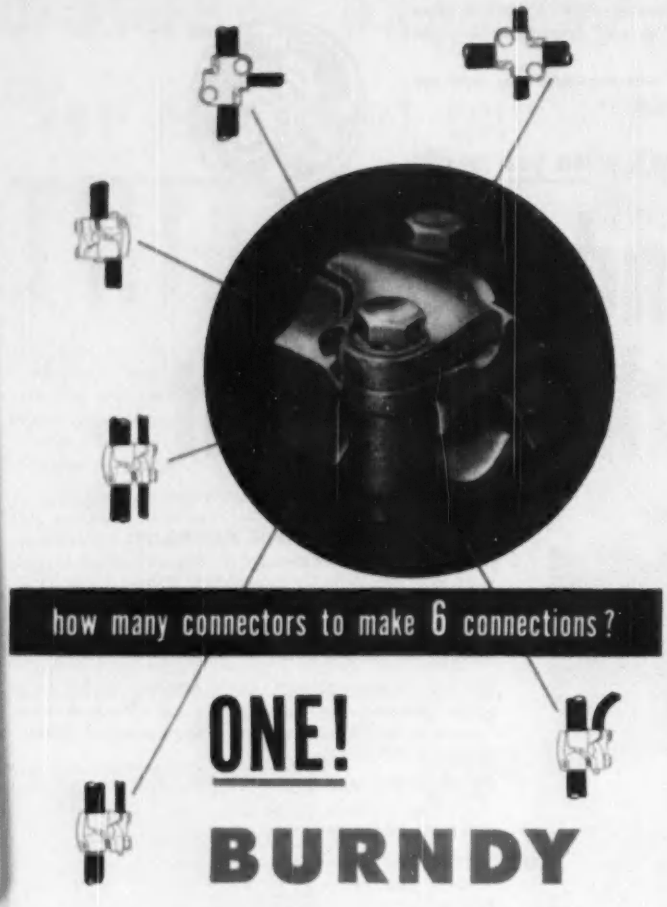
Ask your G-E representative or write to Apparatus Dept., General Electric Company, Schenectady 5, N. Y. for full information on standardized network equipment. Bulletin GEA-5024 describes network transformers; GEA-2017, network protectors.

INCREASED Interrupting Ratings on Network Protectors

Type	Continuous Rating in Amperes	Interrupting Rating in Max. R.M.S. Amperes
MG-13	200 to 600	20,000
MG-8	800, 1200, 1600	30,000
or	2000	35,000
MG-9	2500 and 3000	60,000

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.



Send for Cat. 57, a handy guide to better wiring with popular Burndy connectors.

"Cut stock, cut costs" is the current clamor!

So you give Burndy Versitap the job.

One size (10 sizes take cables from #6 to 1000 Mcm)

Connects a wide range of cable combinations

In tap, tee, cross or end-to-end arrangement.

Results are better too—electrically and mechanically.

And . . . you've found one way to cut stock, cut costs.

See your local Burndy Distributor.

BURNDY NEW YORK 54, NEW YORK

(Continued from Page 29)

THE VARNISHED INSULATIONS STORY, by David O. Woodbury, 88 pages, 5x7, National Electrical Manufacturers Assn., 155 E. 44th St., New York, $1. Covers the nature and purpose of varnished insulations, their origin and development, and their use in rotating apparatus, transformers, cables, power distribution systems, motor controllers, high tension magnetos and electronic equipment. Designed to serve the electrical industry at all levels as an authoritative reference on varnished insulations. The sources for the material included in this publication were the major varnished insulation manufacturers.

GIANT BRAINS OR MACHINES THAT THINK, by Edmund C. Berkeley, 270 pages, 6x9, John Wiley & Sons, $4. Has as its subject machines that calculate, make decisions, choose between different courses of action, determine most of their own instructions—machines that think. Several existing large-scale mechanical computers are described, but the book is more than purely descriptive. Mechanical brains are set in prospective. The amazing possibilities of these machines for the future and the problems of control to direct them toward the greatest good are indicated.

VACUUM EQUIPMENT AND TECHNIQUES, by A. Guthrie and R. K. Wakerling, University of California Radiation Laboratory, 264 pages, 6x9, McGraw-Hill Book Co., $2.50. Deals with the development and study of high vacuum equipment made by the U. C. Radiation Laboratory. The book is a compilation of observations made in the course of developing high vacuum equipment for use in electromagnetic separation plants. A topic of particular interest in this volume is the use of the vacuum analyzer and helium leak detector.

FOURIER METHODS, by Phillip Franklin, 289 pages, 6x9, McGraw-Hill Book Co., $4. A brief textbook covering a variety of mathematical techniques for engineering students of the senior and first-year graduate level. Should be especially valuable to electrical engineering students, and the growing number of aeronautical engineering students who desire an introduction to complex exponentials, Fourier series and Laplace transforms, based on a first course in calculus.

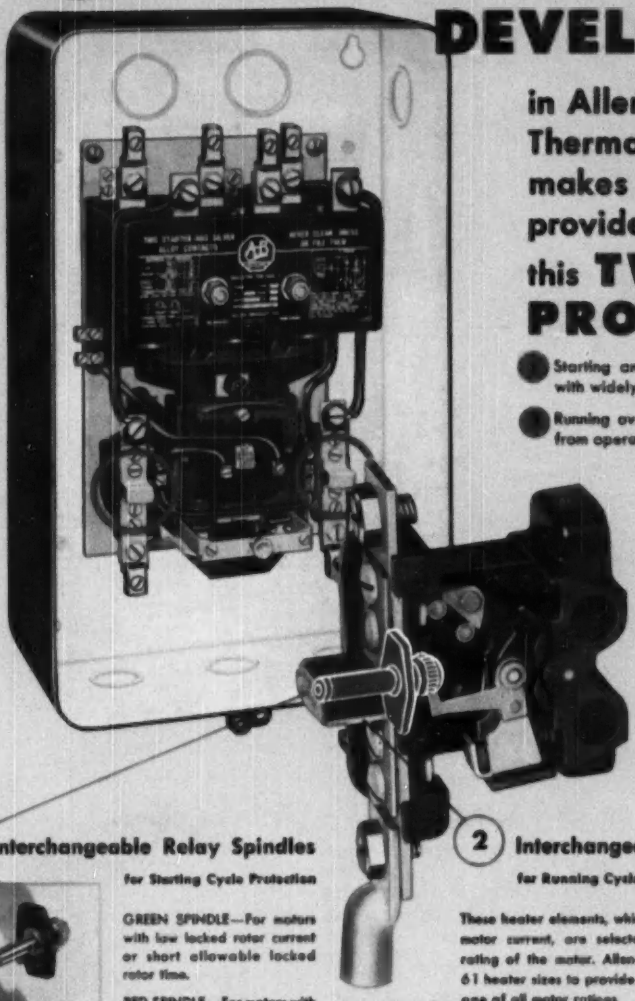
RURAL ELECTRIFICATION ENGINEERING, by Unus F. Earp, 313 pages, 6x9, McGraw-Hill Book Co., $3.50. This is the first book designed primarily for use on the college level as a rural electrification text for professional agricultural curricula. It covers the design features of rural distribution lines; the basic factors underlying the application of electricity to heat, light and power; and the broad administrative considerations underlying a sound and progressive rural electrification program.

CHARACTERISTICS OF ELECTRICAL DISCHARGES IN MAGNETIC FIELDS, by A. Guthrie and R. K. Wakerling, 375 pages, 6x9, McGraw-Hill Book Co., $3.50. Primary emphasis is placed on the case of electrical discharges in vapors of uranium compounds. The volume is not intended as an exhaustive treatise of the subject, since the studies were not made until after a test plant was placed in operation. Much useful information was acquired, however, which will make an important contribution to the understanding of the theory of gaseous discharges and indicate areas for fruitful investigations.

A SPECTACULAR DEVELOPMENT

in Allen-Bradley Thermal Overload Relays makes it possible to provide your motors with this TWO WAY PROTECTION

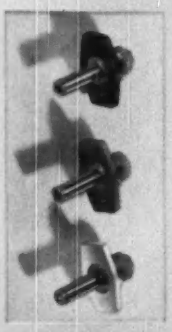
- Starting and locked rotor protection for motors with widely different characteristics.
- Running overcurrent protection to prevent motor from operating at damaging temperatures.



Now you can match your overload protection for motors under starting and locked rotor conditions as well as under running conditions. Allen-Bradley starters now have interchangeable overload relay spindles to provide various tripping characteristics. The proper spindle gives your motor locked rotor and starting protection. The proper heater element gives running protection. Unnecessary shutdowns will then be eliminated.

1 Interchangeable Relay Spindles

for Starting Cycle Protection



GREEN SPINDLE—For motors with low locked rotor current or short allowable locked rotor time.

RED SPINDLE—For motors with normal allowable locked rotor time and normal starting time.

TAN SPINDLE—For motors with normal allowable locked rotor time and long starting time. Ideal for flywheel and other high inertia loads.

Bulletin 815 Resisto Therm Overload Relay... the type used on most Allen-Bradley motor starters.

2 Interchangeable Heater Elements

for Running Cycle Protection

These heater elements, which carry the main motor current, are selected to match the rating of the motor. Allen-Bradley supplies 61 heater sizes to provide adequate coverage of all motor ratings.

These heaters, when used in conjunction with the three types of spindles illustrated at left, provide 183 combinations to match the characteristics of your motors.

That's why Allen-Bradley motor starters provide full motor protection.

ALLEN-BRADLEY

MOTOR CONTROL

QUALITY

A-B Quality

2-50-MR

(OVER)

HOW *Interchangeable Spindles and Heater Elements provide*

TWO-WAY MOTOR PROTECTION on Allen-Bradley Starters

MOST overload relays protect motor windings during the running cycle. But, because motors and motor loads vary so much in character, an overload relay with a single characteristic is unable to provide full motor output and protection under starting and locked rotor conditions.

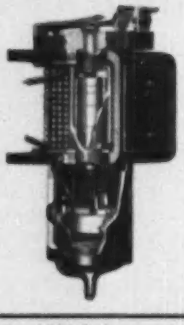
Now, Allen-Bradley offers *interchangeable* relay spindle assemblies in three types—red, green, or tan—which can be changed in the field from the front of the starter. Each has a different over-current tripping characteristic. The running rating of the relay, however, is determined solely by rating of heater element. Heater element provides full running cycle protection; relay spindle assembly provides full protection during starting cycle and locked rotor condition.

If you will give Allen-Bradley engineers complete information on your starting cycle, normal running current, frequency of starting, and ambient temperatures, they will supply the correct combination of heater unit and relay spindle assembly to fit your motor and load condition.

As a result, it will be possible to keep your motor running at a safe operating temperature during starting, running, and locked rotor conditions—adding years of motor life. Now you can work motors safely to full capacity—eliminating unnecessary, costly shutdowns. Write for full information.

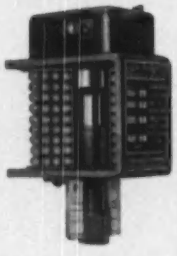
OTHER ALLEN-BRADLEY OVERLOAD RELAYS

BULLETIN 810
DASHPOT TYPE
MAGNETIC OVERLOAD RELAY



Resets quickly after tripping. Ideal for woodworking and other equipment where motors frequently stall. Trip current and tripping times adjustable. Silicone dashpot fluid practically eliminates changes in tripping time with temperature.

BULLETIN 820
INDUCTO THERM
OVERLOAD RELAY



For accurate overload protection of slip ring and squirrel cage motors having normal allowable locked rotor times and locked rotor currents five or more times full load current. Tripping value easily adjusted over wide range.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

ALLEN-BRADLEY

SOLENOID MOTOR CONTROL

QUALITY

A-B Quality

2-50-MB

You can't buy Better Fittings or ones that cost less to use

Cross Section Showing Indentations.

Quicker to use and neater in appearance, Briegel All-Steel Indenter Fittings not only make stronger connections but also make each job more profitable to the contractor and satisfactory to his customers.

Two Easy Squeezes and they're set to stay. It is only natural that the Briegel All-Steel Indenter Fittings are the most widely used E.M.T. connectors and couplings. Contractors the world over recognize their cost cutting qualities and the fact that they make each wiring job neater, stronger and better.

All B-M Fittings Carry the Underwriters Seal of Approval

BRIEGEL METHOD TOOL CO.

GALVA, • ILLINOIS

DISTRIBUTED BY

The M. B. Austin Co., Northbrook, Ill.; Clayton Mark & Co., Evanston, Ill.; Clifton Conduit Co., Jersey City, N. J.; General Electric Co., Bridgeport, Conn.; The Steelduct Co., Youngstown, Ohio; Enamaled Metals, Pittsburgh, Penn.; Kondu Mfg. Co., Ltd., Preston, Ont.

WESTINGHOUSE
Westinghouse "CSP"
TRANSFORMERS

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

For emergency only...

Pull!

When the breaker trips after repeated red light warnings, and you must get back in service without delay . . . *pull the Emergency Control!*

Save costly overtime.

Avoid change-outs under adverse conditions.

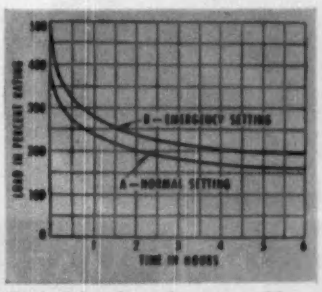
Emergency Control adjusts the "CSP"® breaker to allow greater overload before tripping. It permits regular crews to schedule change-outs at convenience.

Even with Emergency Control in operation, "CSP" Transformers have full lightning and short-circuit protection.

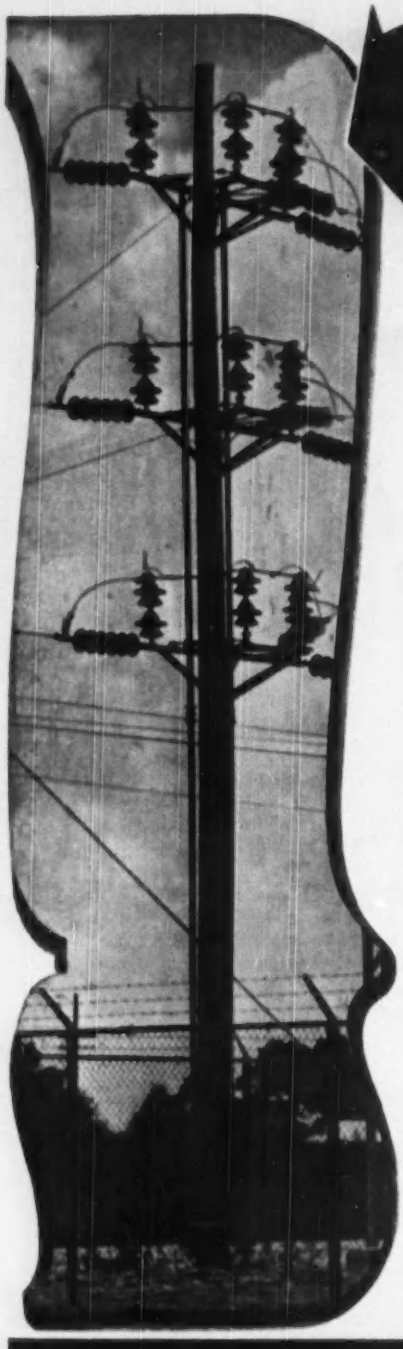
Now standard equipment on all Westinghouse "CSP" Transformers with signal lights, 5 through 100 kva, Emergency Control gives greater assurance of service continuity . . . lets you be sure of maintaining service. Contact your Westinghouse representative or write for Booklet B-4249. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70551

Emergency Control handle, secured in normal operating position with a standard meter seal.

Emergency Control handle in emergency position. This sets breaker for greater overloads.



Typical breaker trip curves, illustrating increased overloads sustained with Emergency Control.



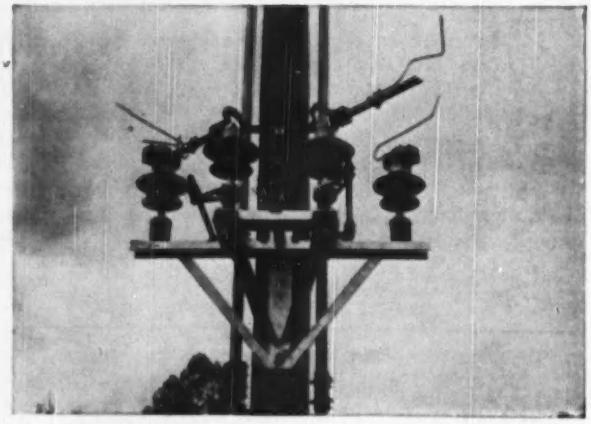
NEW MATTHEWS GOABS...cut switching station construction costs up to 47%

Revolutionary is the word for this new development in power transmission and distribution equipment! Its low installation and maintenance cost, as well as improved operating efficiency, will mean savings on your next switching station construction or renovation.

For example, here's how one Matthews GOABS 3 phase 69kv installation saved over $1700.00† of the cost of installing an old style switching system of the same capacity —

- ***It took 12 hours for job formerly requiring 72 to 80 hours — a terrific savings in labor costs!***
- ***Only one pole was needed where 6 were needed before.***
- ***One ground replaced 2 formerly required.***
- ***Only 54 — 10" suspension insulators needed — 90 were needed for old type switching.***
- ***Matthews GOABS needed only 9 strain clamps — 15 were necessary formerly.***
- ***Steel mounting, tee connectors and steel clamps were completely eliminated.***

In addition to these exceptional economy features, Matthews GOABS offer the greater safety of 180° of free climbing space and outstanding ease of conversion from a lower to a higher capacity switching system.



Write for Bulletin 601, for further information on the new, money-saving Matthews GOABS.
They are available in 600 Amperes — 15, 23, 34.5, 46 and 69kv ratings.

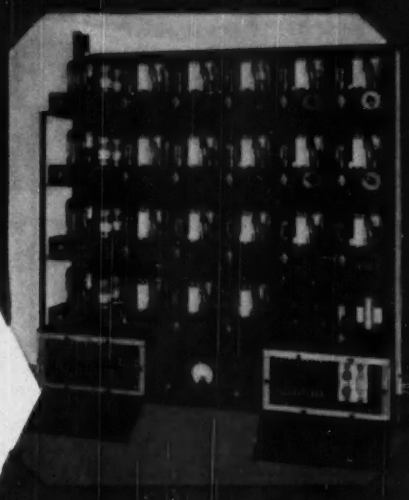
***Gang Operated Air Brake Switch.** **†Detailed figures available on request.*

W. N. MATTHEWS CORPORATION
3948 DELOR ST., ST. LOUIS MO.
ENGINEERS and MANUFACTURERS SINCE 1899

NEW

DRIVER-HARRIS ELECTRONIC TESTING

Obsoletes Previous Methods of Testing Enameled Wire Insulation



This revolutionary Dielectric Continuity Tester at Driver-Harris checks the quality of coating on 19 strands of wire simultaneously—as the wire leaves enameling furnaces. Tap switches on the test units are calibrated in impulses per minute required to operate an alarm. With the speed of the wire known, and also the maximum number of faults per 100 feet permitted by specification, each test unit is readily set to operate in conformance with the terms of the test imposed.

In order to guarantee the quality of a spool of enameled wire, *every inch* of the wire should be checked for dielectric faults, not just a few feet. In general practice, however, only a short sample of wire is examined. This is passed through a mercury cup held at a fixed potential, and shorts through the insulation are indicated on a voltmeter. If faults do not exceed a specified maximum for a given length of wire, insulation throughout the *entire* spool is assumed to be satisfactory.

This inefficient, compromise method has two important disadvantages: (1) the small portion of wire tested may not truly represent the condition of insulation throughout the spool; (2) insulation failures are not discovered until long after the enameling process is completed.

By checking insulation *continuously*, as wire leaves the enameling furnaces—the only 100% dependable way—Driver-Harris' new test equipment obsoletes such ineffectual and wasteful procedure.

So long as specifications are met, the new Driver-Harris electronic tester permits the enameling process to continue uninterrupted. When the *rate* at which faults occur approaches the maximum number of faults permitted by specifications, the test mechanism sounds an alarm and a record is made on a moving chart.

In this way, enamel coating is not only tested for continuity throughout the entire length of spooled wire, but sub-standard enameling is detected—and can be corrected—as soon as it occurs.

Thus makers of wire-wound resistors—particularly in finer sized wire, where shorts are more likely to occur—are enabled to eliminate time-waste and material-waste in their production, and obtain superior, more dependable products.

Makers of world-famous Nichrome and over 80 alloys for the electrical, electronic and heat-treating fields*

Driver-Harris Company

Western Representative: **ANGUS-CAMPBELL, INC.**

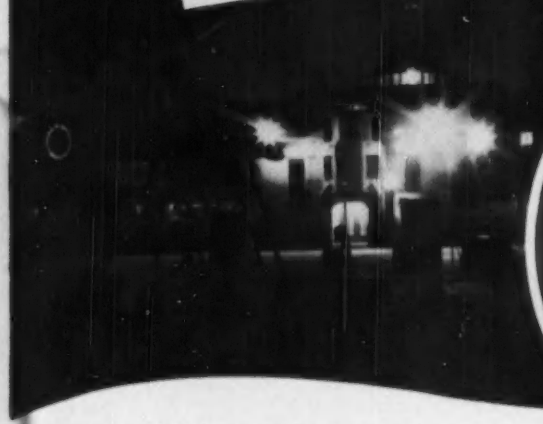
1114 Valencia St., San Francisco 449 So. San Pedro St., Los Angeles

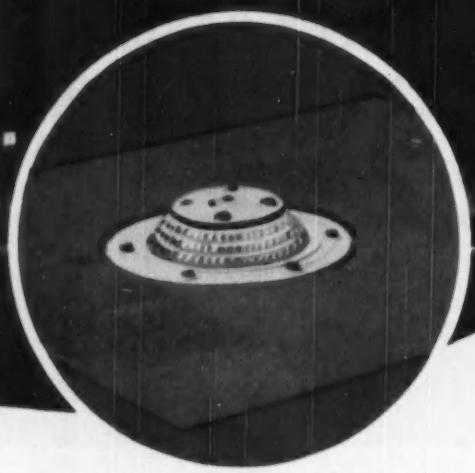
Main Office and Plant: **HARRISON, NEW JERSEY**

FIFTIETH ANNIVERSARY

*T. M. Reg. U. S. Pat. Off.

APPROVED





▲ *Runway lights*, boundary lights, street lights and building lights can all be operated through Amerite-Amerprene Cable.

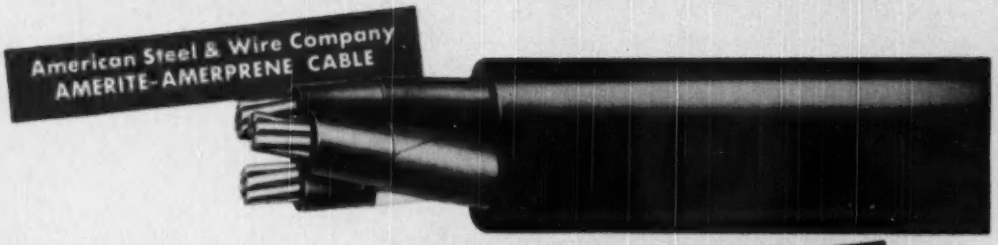
▼ A *shallow trench* is all you need for U·S·S Amerite-Amerprene Cables. You save the cost of an expensive conduit system.

▼ *Installation is simple* under existing runways—drill a hole and pull the cable through. No rigid conduit is needed.

AIRPORT WIRING

by

Civil Aeronautics Administration



THESE two types of U·S·S American Electrical Wire and Cable have been approved by the Civil Aeronautics Administration under specification L-824 for underground airport wiring.

No conduit is needed for these cables. Their insulated conductors are encased in a tough, resilient jacket of Amerprene — a polychloroprene compound that is highly resistant to moisture and soil fluids as well as to mechanical abrasion. Amerprene-sheathed cables can be laid in an open trench and will give reliable service even in soggy ground.

AMERITE-AMERPRENE CABLE is approved as Type A —Style RR for 600, 3000 and 5000 volts. Excellent insulating and physical properties are combined in a single cable.

AMERZONE-AMERPRENE CABLE is approved as Type B—Style ROR for 3000 and 5000 volts. This cable utilizes an ozone-resistant type of insulation.

Both cables are available in single and multiple conductor construction in all sizes commonly used for airport work.

PS Shielding with conducting tape

In addition to these specific designs, we regularly furnish similar constructions for either direct burial or aerial service at even higher voltages. For many applications, our engineers recommend Type PS non-metallic shielding, supplemented by bare copper ground or drain wires. This unique method of shielding is designed to protect workmen from injury, and to prevent possible damage to the rubber insulation from the effects of corona or ionization.

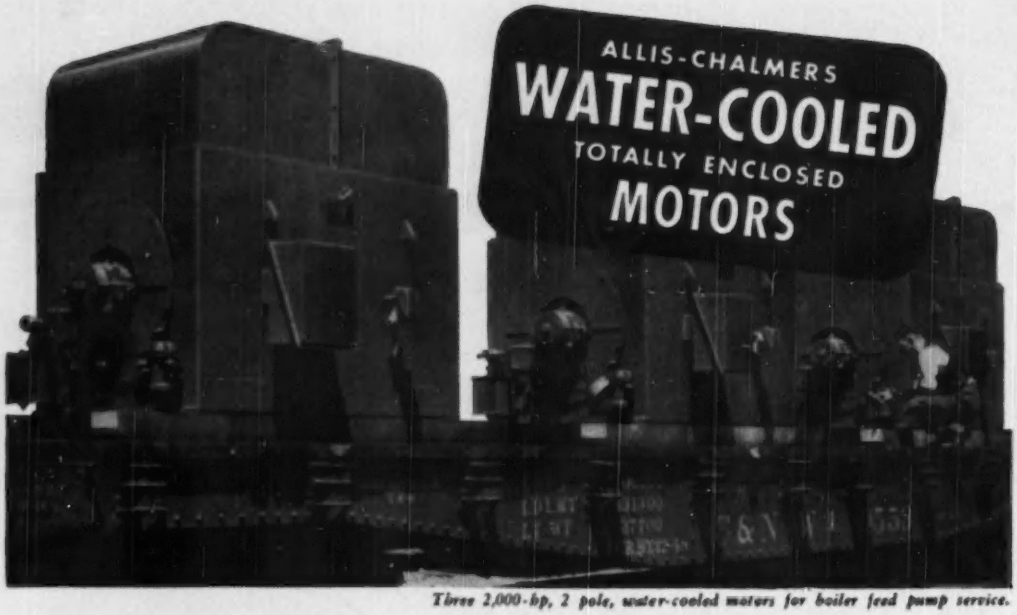
Write for specifications

Amerite-Amerprene and Amerzone-Amerprene Cables are among the first approved by the Civil Aeronautics Administration for use in the new airport building program. Any office of the companies listed below can supply you with detailed information on these two types of cable.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **AMERCLAD ELECTRICAL WIRE & CABLE**

UNITED STATES STEEL



Three 2,000-hp, 2 pole, water-cooled motors for boiler feed pump service.

DIRT-PROOF

COOLER Dissipate motor heat in water. Keep heat out of power-house.

QUIETER Lower sound level where unusually quiet motors are required.

AND Protect against dirt, corrosion and moisture. Permit outdoor installations.

YOU CAN PRACTICALLY ELIMINATE maintenance due to dust, dirt, fly ash, and moisture by using Allis-Chalmers water-cooled, totally enclosed construction for power plant auxiliary motors.

Place these protected motors outdoors or indoors, and you'll enjoy positive dirt protection. Indoors there'll be less heat in the power-house — especially in the summer time.

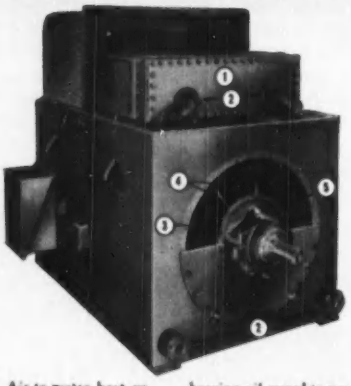
In addition, you'll find that this A-C ventilating and cooling system lowers the sound level.

Motors of this type can be provided for the larger power-house auxiliary drives. Size and weight are not appreciably increased over open motors of the same rating.

For complete information, outline your requirements to your nearby A-C Sales Office, or write direct. A-2973

ALLIS-CHALMERS, 939A SO. 70 ST.
MILWAUKEE, WIS.

WATER-COOLED MOTOR CONSTRUCTION



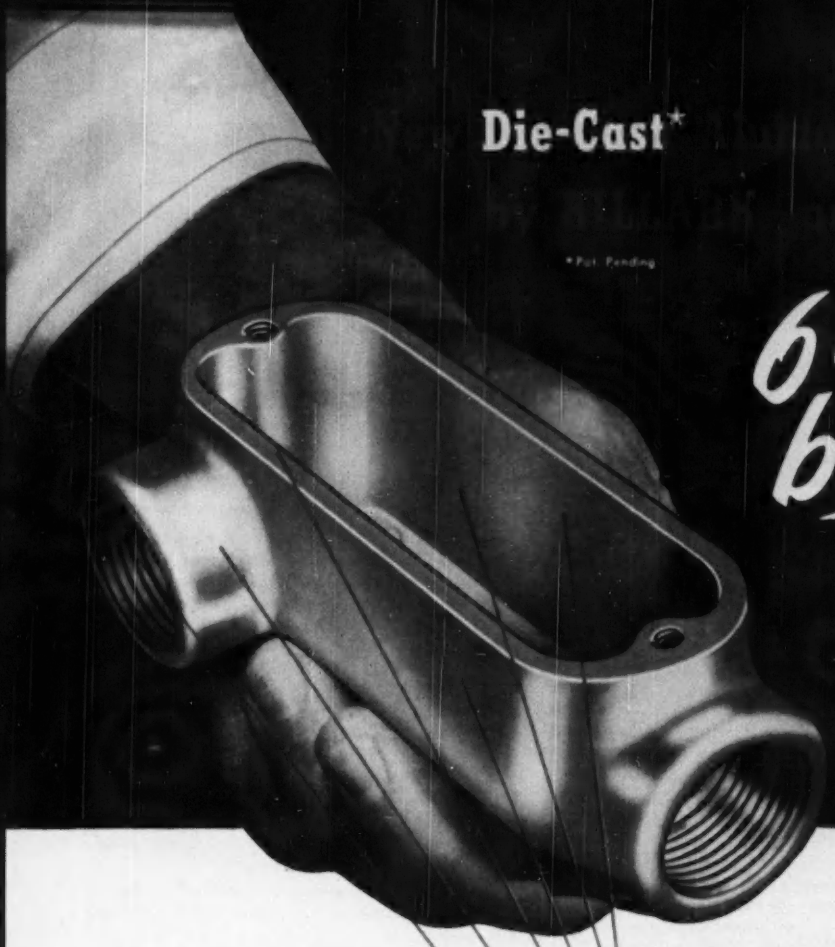
1. Air-to-water heat exchanger
2. Water connections
3. Rotor fan
4. Air pressure lines to bearing oil guard to prevent oil leakage into windings
5. Capsule type bearing

ALLIS-CHALMERS

Die-Cast*

*Pat. Pending

6 ways better



Now **for the first time** — the superiority of aluminum is available for you in a DIE-CAST* fitting. Seven years of Killark metallurgical research and on-the-job testing prove conclusively that these modern Killark fittings (die-cast under ten thousand pounds pressure) give you advantages in performance . . . dependability . . . and sales that have never been offered before!

- **LIGHTER IN WEIGHT!** Only 40% as heavy as iron
- **STRONG AND MALLEABLE** Alloys combined with aluminum give this superior metal. Alumalloy is not brittle — will withstand shock and strain far beyond actual practice on the job.
- **NON-CORROSIBLE** Rust proof and highly resistant to all corrosion
- **UNMATCHED UNIFORMITY** Because these fittings are die-cast under tremendous pressure — all fittings are identical
- **SMOOTH FINISH** A finish like satin — no sand marks or burrs, gives protection to wire insulation and easier handling
- **CLEAN CUT THREADS** Because of die-casting under 10,000 lb. pressure, Alumalloy becomes perfectly uniform and takes a clean cut thread

K KILLARK ST. LOUIS

Killark

PROVE IT TO YOURSELF . . . FREE! Send for one of these revolutionary new fittings . . . test it yourself, and you'll see why it is **6 ways better than any fitting you've ever handled.**

ELECTRIC MANUFACTURING COMPANY

Vandeventer and Easton Aves. St. Louis 13, Missouri

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NEW YORK	30 Irving Place
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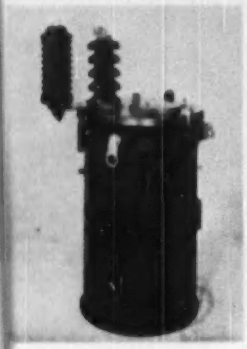
PRODUCT NEWS

CSP Transformers For 25-kv. Rural Lines

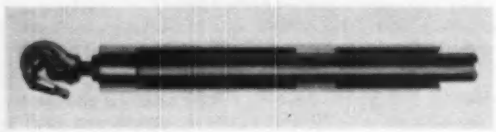
(1) Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

CSP rural distribution transformers for operation on 25-kv. multigrounded systems are designed to permit economical service to sparsely settled rural areas or an increase in capacity in existing heavily loaded rural systems. All protective features of the old CSP transformers are included in the new design, according to the manufacturer. Electrical characteristics are based on extrapolation from existing distribution transformer performance specifications, it is stated.



The new transformers are of simple, shell construction with two type C core loops of high-permeability Hipersil. Coil grouping is low-high-low to give low impedance. Basic insulation level is 125 kv., full wave. All high-voltage taps are brought to a porcelain-base tap changer. Cases are of round-tank construction with double-seamed bottom and rolled top. Two sets of hanger lugs are provided for two-position mounting on pole or crossarm. The single high-voltage bushing is secured mechanically on the underside of the cover, eliminating external steel flanges. Transformers are equipped with the latest type De-ion arresters.

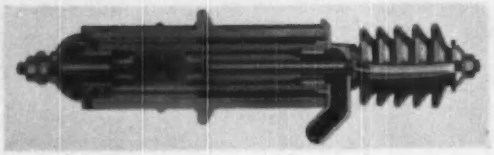
They are rated from 3 through 50 kva., single-phase, 60 cycles, 24,940 Grd. Y/14,400 to 120/240 volts with full-capacity taps at 13,800, 13,200 and 12,870 volts and a reduced-capacity tap at 12,540 volts.



Safety Feature for Hot Sticks

(2) The James R. Kearney Corp., 4236 Clayton Ave., St. Louis 10, Mo.

Newly developed Rainshield sticks feature a plastic shield on a Han-Pol. The shield forms a chamber sealed at the upper end, with an air gap at the lower end to break the flow of moisture down the stick. These shields are available on all the company's standard hot sticks, or may be secured separately for mounting on 1¼-, 1½-, 2-, 2½- and 3-in. poles. Fit-On Rainshields are available also for use with clampsticks or Fit-On poles.



Vertical Autogap Lightning Arrester

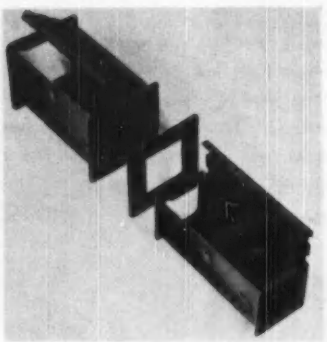
(3) Hubbard and Co., 6301 Butler, Pittsburgh, Pa.

This arrester has been brought out in a vertical model, claimed to have all the essential features of the older horizontal Autogap. It does not replace the horizontal model, but is designed for installations where a vertical type is desirable. Only difference, other than physical arrangement of parts, is that the process of expulsion acts vertically instead of horizontally. According to the manufacturer, the vertical design, like the horizontal, extinguishes the follow arc before it reaches the first current zero. The new Autogap comes in three sizes, with voltage ratings of 3, 6 and 9 kv.

Wireway Reducing Bushing

(4) Keystone Mfg. Co., 23328 Sherwood Road, Center Line, Mich.

Designed to give a quick means of effecting reductions from 6-in. to 4-in. wireways, this new bushing is said to permit contractors to branch off from main wireway and power lines to smaller outlets without use of piping and other improvised means. It is made of heavy-gage metal; is 7½ in. square with a 4-in. square center opening. Holes around the edges of the bushing are located to conform with the hole locations in the flanges of both sizes of wireway.



New Fence Requires No Paint

(5) Copperweld Steel Co., Glassport, Pa.

Chain link fence made from Copperweld is now available. Copperweld consists of a thick layer of pure copper which permanently covers and protects the high-strength steel core, the special molten-welding process making the two metals inseparable. Since copper does not rust, the fence does not require painting.

Filling empty sockets everywhere—General Electric's

BRIGHTEN-UP TIME PROMOTION

NATIONWIDE ADVERTISING IS BUILDING DEMAND

Beginning April 2nd, customers in your area will be reading about General Electric's Brighten-Up Time promotion featuring a "Spring Shower of G-E Lamp Values!" Full-color ads are backing it up in the Post, This Week, and Parade. Plus spot radio announcements and commercials on the Fred Waring television show!

SPECIAL DISPLAY PIECES FOR AGENTS!

Bright, colorful counter cards! Window streamers and wall banners! Special display pieces! Everything lamp agents need to catch their share of Brighten-Up Time's rain of profits . . . and help push residential lighting load to a new peak!

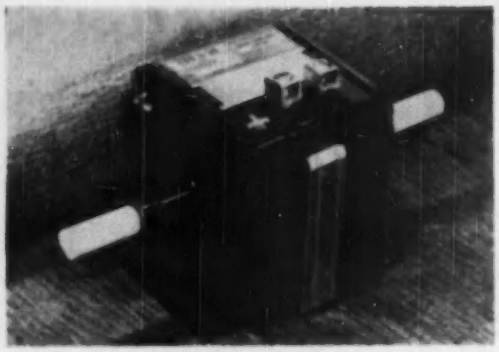
A NEW KIND OF LAMP TO SPARK SALES!

General Electric's new White lamp gives softer shadows and less glare, because it's "all-over bright". Now being featured in G-E advertising. 100-watt size, 20¢ plus tax.

Be sure to see the Fred Waring television show every Sunday night.

You can put your confidence in—

GENERAL ELECTRIC



Indoor Current Transformers

(6) Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

MR through-type current transformers are for low-voltage metering indoors with or without thermal demand meters. They are said to have an exceptional accuracy with ASA class 0.3 at burden B-0.1 and a continuous rating of 200% while not exceeding a temperature rise of 55°C. According to the manufacturer, accuracy is maintained over this entire current span so that only two current transformers — 200- and 400-amp. ratings — are required to meter in the complete range from 10 to 800 amp. Use of grain-oriented Hipersil in the core is said to reduce weight and dimensions.

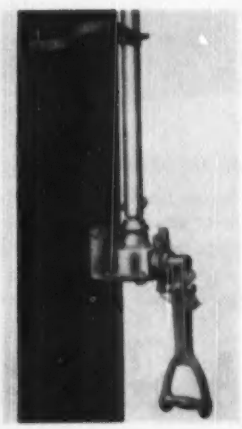
This unit is mounted in a compact metal case with Moldarta cover and a removable, silver-plated primary conductor. Secondary terminals are mounted on phosphor bronze supports and have solderless connectors that will accommodate No. 6 to No. 14 conductor. No short-circuiting device is used since the open-circuit voltage under full load is only approximately 100 volts.

Type MR transformers are for operation up to 600 volts with primary current ratings of 200 or 400 amp. to 5 amp. A 3-wire transformer is available also with a ratio of 200-200 to 5 amp.

Switch Operating Mechanism

(7) Railway and Industrial Engineering Co., Greensburg, Pa.

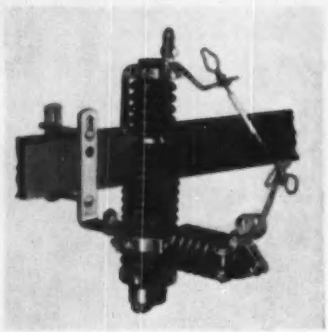
A new operating mechanism for opening and closing rotating, insulator-type outdoor disconnecting switches is of light-weight aluminum alloy. It has a 15-in. operating handle connected through 2:1 reduction bevel gears to the vertical operating pipe. It is applicable to switches having crank operating angles between 75° and 120° and is available for clockwise or counterclockwise drive. It may be used for any switch up to and including 34.5 kv., 1,200 amp. Mechanism can be operated with one hand.



Combination Arrester and Cutout

(8) Line Material Co., Milwaukee, Wis.

This device was designed primarily for low-cost protection of conventional distribution transformers on rural lines with ratings of 7,200/12,470 and 7,620/13,200 volts, grounded Y. It combines features of L-M's 9-kv. type PF3 expulsion distribution lightning arrester and a 7.5-kv., 50 amp. open-link fuse cutout; costs one-fourth less than the two units purchased individually. It comes with a standard EEI-NEMA mounting bracket for cross-arm or flat surface mounting or a bracket for mounting directly to a distribution transformer.



It is said to provide low-impulse sparkover voltage and high discharge current characteristics, giving best possible transformer protection. Other features are sturdy wet process porcelain housing with ample leakage distance; a heavy-duty external gap and the fiber tube and fiber plug with wedge-shaped arc-switching chamber that blows the arc in a half cycle or less.

New Time Switch

(9) Reliance Automatic Lighting Co., Racine, Wis.

The Model 400 is available in single-pole, single-throw construction and rated at 20 amp., 125 volts; is said to include many features usually found only in heavier switches. The timing element is synchronous motor driven with a precision gear train and vernier time set. Indicator revolving at 1 r.p.m. shows when the timing motor is running. Contacts are silver-to-silver, and numbered terminals are provided for all connections. The cabinet is one-piece deep drawn steel with hinged cover, 4x7¼x3⅛ in. deep. Switch operates on a 24-hour schedule, closing and opening the circuit once daily. Minimum "on" period is five minutes; maximum is 23 hours. This switch is particularly suited to automatic control of circuits up to 2,500 watts, it is stated.

Push-Button Range Switch

(10) General Electric Co., Construction Materials Department, Bridgeport, Conn.

This new compact push-button switch will give any desired heat on an electric range by pushing one button. It is small enough to fit any standard back splash and can be mounted horizontally or vertically.

Nicopress

The Tool and the Sleeve

that are made to work together

together they make the perfect splice

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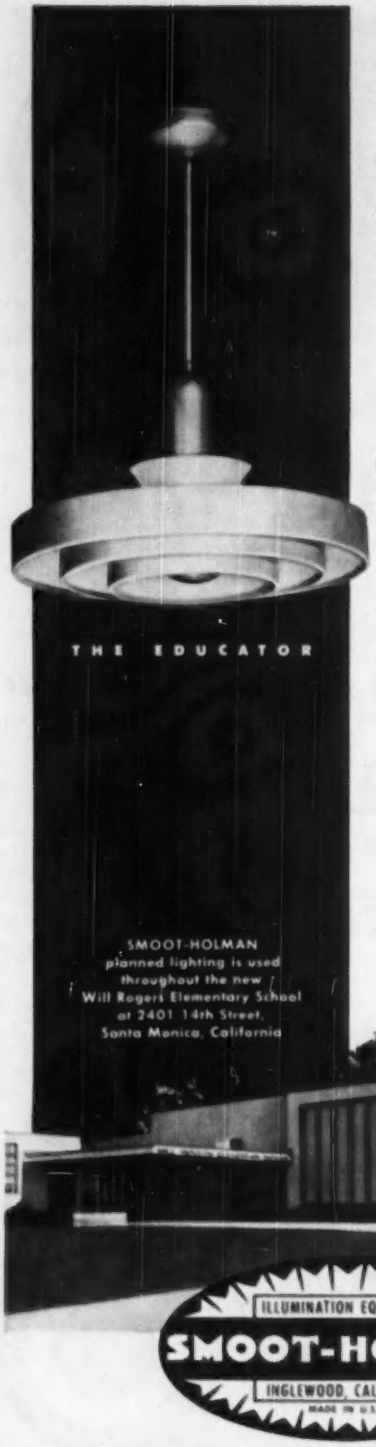


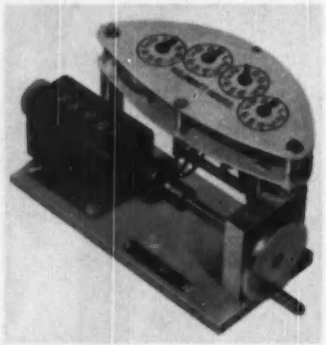
Another Outstanding School selects the finest in CLASSROOM LIGHTING

Modern educators and architects agree on the vital importance of perfect lighting for young eyes. No wonder hundreds of modern schools call for planned lighting by SMOOT-HOLMAN engineers and for illumination equipment guaranteed by SMOOT-HOLMAN built-in quality!

ILLUMINATION EQUIPMENT
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA
MADE IN U.S.A.

Offices in Principal Western Cities Branch and Warehouse in San Francisco

(11) This manual motor controller and enclosed general-purpose circuit breaker is fully magnetic; is available in single, 2- and 3-pole construction from Heinemann Elect. Co., Trenton 2, N. J.



(12) This hand checker is for use with any G-E watt-hour meter register except the I-50. It is portable, self-contained, requires no motor connections. A product of Eastern Specialty Co., 3617 N. 8th St., Philadelphia 40.

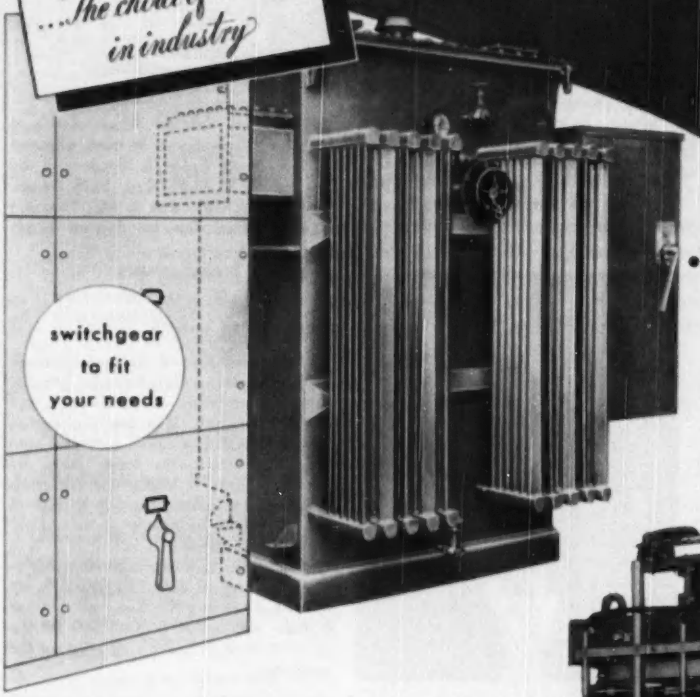
(13) This new-type variable-speed motor incorporates the Herringbone rotor, labyrinth seals, heavy-duty ball bearings. Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Road, Los Angeles

WAGNER TRANSFORMERS
...The choice of leaders in industry

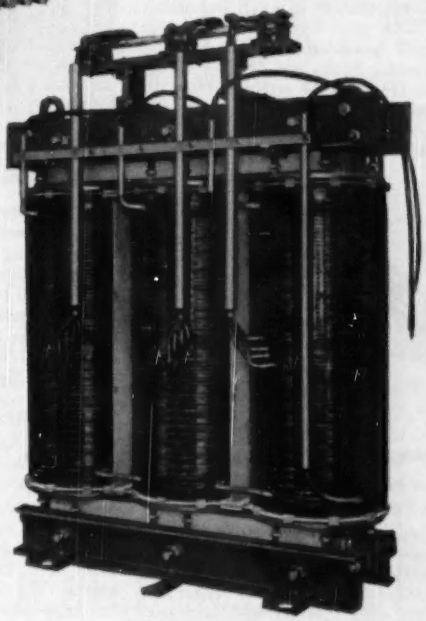
Wagner Unit Substation Transformers

designed to meet your distribution requirements

switchgear to fit your needs



Core and coil assemblies of Wagner unit substation transformers are designed by experienced engineers, and built and tested by skilled workers. Highest quality materials are used throughout, and meticulous attention to detail marks each step in their construction.



The transformer is the vital part of a load center distribution system. If the transformer fails, the entire system is dead whereas only part of the distribution system is affected by the failure of a switch or circuit breaker.

You can be sure of a dependable continuous flow of power from a Wagner transformer and you can be sure that it has been carefully designed to meet your distribution requirements.

Wagner unit substation transformers with incoming high voltage switch-sections to meet your requirements, and with proper throats on the secondary side to connect to any make of switchgear, are available in the usual range of ratings up to 2000 kva. Our factory-trained sales engineers are well qualified to recommend the various combinations necessary to handle your unit substation requirements and they will be glad to give you immediate service.

Wagner unit substation transformers have been installed in all kinds of industrial plants including synthetic rubber, petroleum, steel, chemical, aircraft, automotive, paper, and many others. The importance of the transformer in a unit substation justifies calling in the Wagner sales engineer to help solve your load center problems.

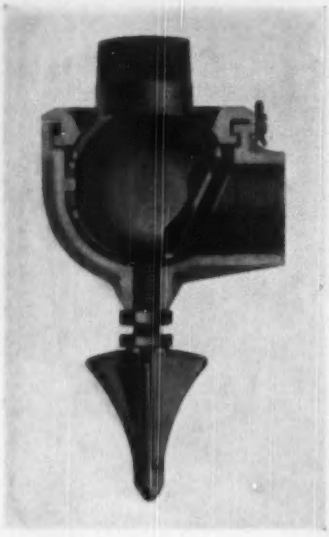
Bulletins TU-13 and TU-56 describe the design and construction features that make Wagner liquid-filled and dry-type unit substation transformers outstanding.

Wagner Electric Corporation
EST. 1891

WAGNER ELECTRIC CORPORATION
6381 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS · TRANSFORMERS · INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

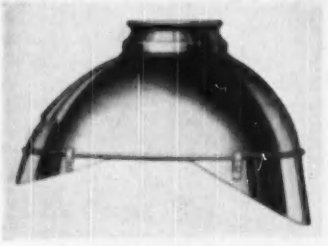
BRANCHES IN 29 PRINCIPAL CITIES



Adjustable End Fitting

(14) Hubbard and Co., 6301 Butler, Pittsburgh, Pa.

The Levelite, a flexible end fitting for pipe arms, consists of a ball and socket joint with pipe fitting, luminaire fitting and spearhead lock bolt. A lug in the housing limits the rotation of the ball to 17° from the vertical in any direction, thus preventing injury to the cable. The fitting has a gasket that seals out all moisture.



Stainless Steel Reflectors

(15) Line Material Co., Milwaukee 1, Wis.

This stainless-steel Directolite is recommended by the manufacturer for residential street lighting. The physical properties of Grade 18-8, type 302 stainless steel give strength and permanence and efficient low-cost service, it is stated. An electro-polishing treatment is said to assure high light utilization. The reflector is asymmetric in design and gives an IES type II light pattern. It is available with a complete line of collars for attachment to porcelain and metal heads in which correct focal position is obtained with

normal settings for 1,000 and 2,500 lumens, 5⅜-in. light center series lamps or 5¼-in. light center multiple lamps.

Fluorescent Sun Lamp

(16) Westinghouse Lamp Division, Bloomfield, N. J.

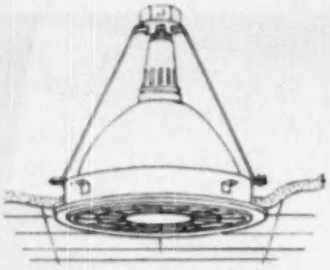
A fluorescent sun lamp, designed to irradiate any interior at low cost, comes in 20- or 40-watt sizes; is identical in dimensions and electrical operating characteristics with standard F lamps. It emits radiations over a large area with an output concentrated in the mid-ultraviolet wave lengths. A soft blue light of low visibility is produced by the lamp which remains cool enough to be touched by the human hand.

(17) This bulb changer employs a vacuum operated rubber holder. Vacuum is created by a built-in vacuum pump which operates with a single stroke. It handles all bulbs from 15 to 1,500 watts, including the new R-40 and PAR-38; fits all types of fixtures, including non-rigid installations. Made by Lumidor Mfg. Co., Los Angeles 11

Load Centers

(18) Square D Co., 6060 Rivard St., Detroit 11, Mich.

A "plug in" feature in these multi-breaker load centers for lighting and appliance circuits makes it possible to add or change circuits. MO 12 gives 2, 4, 6, 8, 10 or 12 circuits, as required. The basic unit consists of a box with bus structure and one 4-circuit plug-in unit in place; units are available in ratings of 15, 20, 30, 40 and 50 amp., 120/240 volts a-c. Type MO 20 is similar, but has space for as many as two or four circuit units, giving up to 20 circuits. Load centers come with flush or surface-type mounting covers and 3-phase, 4-wire arrangement.



(19) A new line of Alzak aluminum high-bay Gym lights in both exposed and recessed types is announced by the Edwin F. Guth Co., 2615 Washington Ave., St. Louis 3, Mo. This unit is engineered for 60 degree beam

Lighting Transformers

(20) Marcus Transformer Co. Inc., 32-34 Montgomery St., Hillside 5, N. J.

An improved line of dry-type general-purpose lighting transformers, permits greater circulation of air through and around the unit. The built-in wiring compartment has been enlarged and available knock-outs have been increased. Class B heat-proof materials and the new Johns-Manville Quinterra have resulted in greater overload capacity, it is claimed.

Available from stock in the single-phase ratings of 480/240-120/240, up to and including 15 kva., as well as 3-phase ratings of 240 or 480 on the primary and 120/208Y, 4-wire on the secondary.

(21) A resistor heating device keeps this ultraviolet lamp warm despite outside temperatures. Called the Sterilaire, the unit uses a standard 18-in. 15-watt germicidal lamp. It is made by Ultra Violet Products Co., 5205 Santa Monica Blvd., Los Angeles, Calif.

ELECTRICAL WEST

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ELECTRICAL WEST

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The editors of Electrical West will be glad to answer questions on engineering techniques; in the lighting and wiring fields; on the electrical code; on merchandising and appliance markets and other phases of the electrical industry in the eleven Western states.

Dear Editor:

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NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... STATE .....

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Reader Service Department
ELECTRICAL WEST
68 Post Street
San Francisco 4, California

← **USE THIS CARD**

- **if you have a problem**
- **if you want to ask a question**
- **if you want to comment on any department in this magazine**
- **if you have a "gripe."**

To secure further information on new product or new literature items listed elsewhere in this section, fill in the card on the reverse side and mail it.

USERS SAVE 2/3

with
Westinghouse
Fluorescent Lamps

the lamps that last 3 times as long... yet cost no more!

Yes, one Westinghouse fluorescent lamp now lasts as long as 3. In average store installations, for example, it lasts 2½ years; in average one-shift offices or factories, 3 years. You actually buy lamps only ⅓ as often! You also save on *the time spent replacing burned-out lamps.* So, start getting these economies now. Next time specify Westinghouse fluorescent lamps. Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J.

YOU CAN BE SURE... IF IT'S Westinghouse

KLEINS

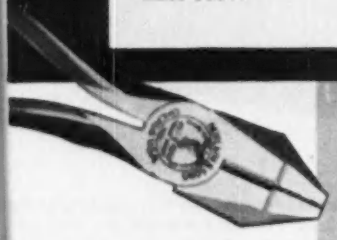
FOR MEN WHO WANT

the Best

• Ever since the first communication and power lines were strung, Klein Pliers have been the favorite tools of electrical workers.

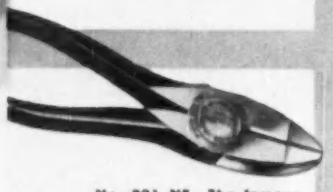
Today, Klein Pliers are made with the same exacting care that has won these tools their reputation for high quality.

Klein Pliers are still preferred by skilled workers in every field as they have been "since 1857."



No. 201. Original pattern husky Klein Side Cutting Plier. Square nose. Made in four sizes—6, 7, 8, and 9 inches.

No. 242. Klein Oblique Cutting Plier (heavy-duty pattern). A very useful tool that cuts close. Length, 6 inches.



No. 201 NE. The famous "streamlined" Klein Side Cutting Plier. Made in four sizes—6, 7, 8, and 9 inches.

No. 203. Klein Long Nose Plier. Long reach of jaws permits getting into difficult places. Made in 6 and 7-inch sizes.

The Klein Pocket Tool Guide, showing the Klein line and containing useful tool information, will be mailed on request.

Established 1857

Mathias KLEIN & Sons

Established 1857 Chicago, Ill., U.S.A.

1500 BELMONT AVE CHICAGO 18 ILL

(22) SPLICE—New straightline splices for ACSR conductors No. 2 and 4 provided for 7/1, 6/1 strand, in both sizes. This type of splice requires no tools for installation. Made by Reliable Electric Co., 3145 Carroll Ave., Chicago 12, Ill.

(23) PULL-SWIVEL—A pull-swivel for use between pulling line and cable messenger turns freely at both ends; is said to prevent cable from twisting around the messenger. Made of seamless copper shell, with ball thrust bearings; turns freely under tensions up to 7,500 lb., with ultimate strength of assembly in excess of 10,000 lb. Approximately 16 in. long, 1¾ in. in diameter; weighs 6¼ lb. Fargo Mfg. Co., Poughkeepsie, N. Y.

(24) HOUSING—A plastic cable splice housing that reduces time needed to splice power and signal cables and gives a durable watertight electrical seal has been developed by U. S. Rubber Co., Rockefeller Center, New York 20, N. Y.

(25) RELAY—The Bulletin 849 pneumatic timing relay is an adjustable timer available for a-c or d-c. It utilizes a synthetic rubber bellows for controlling tripping time. Range is adjustable from 10 cycles to 3 minutes, with an accuracy of plus or minus 10%. Allen-Bradley Co., Milwaukee, Wis.

(26) MOTORS—New squirrel-cage, totally enclosed, type CSP, explosion-proof Life-Line motors are announced by Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa. Heavy steel construction is used to resist corrosive atmospheres. Designed for constant-speed drive applications, such as pumps, blowers, or compressors, these motors may be used safely in any location where Class 1 Group D explosive materials or atmospheres are encountered. Available in frames 224-336, in 1- to 20-hp. ratings, for 2- and 3-phase, 25-, 50-, 60-cycle, 208-, 220-, 440-, 550-volt service.

(27) PANEL—A flexible circuit breaker panel, known as the Federal Noark QL Panelette, employs Quicklag circuit breakers in a calibrated range of 15, 20, 30, 40 and 50 amp., and QL Panelette cabinets with 2-, 4-, 8-, 16- or 20-circuit breaker capacity. Any desired circuit combination can be attained by snapping in Quicklag units of the proper calibration. Double-pole operation is secured by adding handle extensions. Federal Electric Products Co., 50 Paris St., Newark 5, N. J.

(28) DISCONNECTING SWITCH—Type 0-2 has high pressure silver-to-silver contacts at both clip and hinge; stainless-steel springs that are independent of current path; smooth controlled blade closing action; enclosed linkages for applying pressure and controlling blade; easy operation with over 1-in. ice build-up over entire switch; insulators relieved of stress when switch is closed; blades counterbalanced with springs that will not freeze. It is available in the complete range from 400 to 4,000 amp. and from 7.5 to 287 kv. Cole Electric Co., Culver City, Calif.

(29) BRUSH—A vibration-absorbing brush for rotating machinery has been developed by Helwig Co., 2544 N. 30th St., Milwaukee 10, Wis. It was designed for mill-type motors and has a Neoprene pad fused to the carbon by a cement that unites chemically with Neoprene when heat and pressure are applied in manufacture.

Another First . . .

the new

BRONCO 60

CERTIFIED

NEOPRENE JACKETED
CORDS AND CABLES

First Again

FIRST to certify the Neoprene content and so brand each piece of wire.

FIRST to introduce a cord and cable jacket containing 60% by weight of Neoprene.

For many years, 60% by weight of rubber or Neoprene has been the recognized standard of highest quality in electrical cord and cable jackets. Since the development of Neoprene, manufacturers have been endeavoring to produce such a jacket. Now Western has reached this goal!

The result of years of extensive research, BRONCO 60 *CERTIFIED* brings you electrical cords and cables containing 60% by weight of new Neoprene. Western is the only manufacturer to offer this *Certified* protection.

Every carton and reel of BRONCO 60 *CERTIFIED* carries a certificate signed by a registered, professional engineer. This is your assurance of more value for every dollar invested in cords and cables. Longer lasting cold rubber insulation — soft annealed electrolytic copper strands, moisture repellent cushioning fillers, assembled to provide maximum flexibility: these features, combined with the new BRONCO 60 *CERTIFIED* Neoprene jacket, give you longer lasting, safer and more economical cords and cables . . . cords and cables still more resistant to oils, chemicals, acids, cutting and abrasion. *AND* every piece is branded "BRONCO 60 *CERTIFIED*," with the size, number of conductors and voltage, for added protection.

For maximum value and protection, be sure to specify — insist on — and get —

BRONCO 60 *CERTIFIED!*

Manufactured by

WESTERN INSULATED WIRE CO.

1001 EAST 62ND ST. • LOS ANGELES 1, CALIFORNIA

Write today for a sample of BRONCO 60 CERTIFIED and a complete catalog.

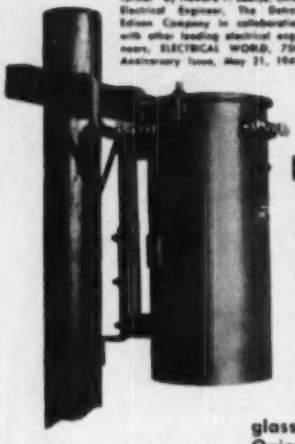
NOW! the transformer of the future

FUTURE POSSIBILITIES

. . . It is to be expected that such activity (improvements) will continue in the future. Much of it can probably not be foreseen at this time. There are a few items, however, which might be mentioned as either distinct possibilities or highly desirable.

There is considerable promise of the production of a dry-type distribution transformer for pole top installation. The advantage will be less weight and lower maintenance. It seems possible that on such a transformer the case might be reduced to a minimum or perhaps be eliminated entirely.

Excerpt from "Distribution Transformer" by Howard P. Seelye, Chief Electrical Engineer, The Detroit Edison Company in collaboration with other leading electrical engineers, ELECTRICAL WORLD, 75th Anniversary Issue, May 31, 1949



MARCUS

DRY TYPE AIR COOLED DISTRIBUTION TRANSFORMERS

Months before the publication of this excellent article on distribution transformers, Marcus, a pioneer in the field, announced a new line of all purpose dry type distribution transformers for indoor or outdoor service.

The complete absence of hazardous oil or toxic liquid affords safety never before realized. Superior Class B and C heatproof insulation, such as fibreglass, mica, porcelain, new Johns-Manville Quinterra, etc., results in overload capacities unobtainable with Class A oil filled units. The entire transformer element is seal protected against oil, acids, moisture, etc., and is housed in a sturdy, scientifically ventilated, weather proof case which conforms with all applicable EEI-NEMA construction standards. This extremely versatile transformer can be used outdoors, pole or platform mounted or indoors at the load center, mounted wherever convenient with no expensive fireproof vault required.

Currently available in sizes to 100 KVA, voltages to 5000 V.

AIR-COOLED TRANSFORMERS EXCLUSIVELY
1 to 2,000 KVA up to 15,000 Volts to meet individual Requirements
- DISTRIBUTION
- GENERAL PURPOSE
- UNIT SUBSTATION
- PHASE CHANGING
- ELECTRIC FURNACE
- RECTIFIER
- WELDING
- MOTOR STARTING

Write for Bulletin #49-ACO

COMPETITIVE PRICES MTC GOOD DELIVERIES

MARCUS TRANSFORMER CO. INC
40 MONTGOMERY STREET
HILLSIDE 5, NEW JERSEY

PIONEERS IN THE FIELD OF AIR COOLED TRANSFORMERS

NEMA

H. H. HENDRET COMPANY
Seattle 4, Washington
•
E. B. COLE COMPANY
San Francisco, California
•
ROBERT A. YOUNG & COMPANY
Los Angeles 13, California

(30) BOX COVER SWITCHES—A new line available in 3¼ and 4 in. types from Pass & Seymour Inc., Syracuse 9, N. Y.

(31) LAMP BASE—A plastic base with a sloping shoulder and a positioning bump to simplify fluorescent lamp installations has been developed by Westinghouse at Belleville, N. J.

(32) SWITCH MECHANISM—A hydraulic switch operating mechanism for manual or motor operation has been developed by Royal Electric Mfg. Co., 1122 E. 87th St., Chicago 19, Ill. The action on operating handle forces fluid from double-acting cylinder through tubing to cylinder at switch location on top of structure. Fluid forced into this cylinder acts on piston which operates switch through interphase shaft. Pressure can be developed in the order of 1,000 lb. per square inch and equipment is protected from excessive pressure by pressure relief valve. In normal operation, less than 300-lb. pressures are developed.

(33) SWITCH—An electric switch that starts a motor in either direction, reverses it instantly, or brings it to a quick stop has been developed by the Iron Fireman Mfg. Co., Portland, Ore. Called the Reverswitch, this device gives split-phase and capacitor-start motors the reversing characteristics of 3-phase motors.

(34) LAMPHOLDER—A new Slimline fluorescent lampholder takes all size lamps from T-6 to T-12. It combines the standard single-screw mounting, bi-pin type with a built-in "telescopic" feature, which operates on a strong coil spring, holds lamp securely, allows for ⅛ in. variation in lamp lengths. Kulka Electric Mfg. Co., Inc., 30 South St., Mt. Vernon, N. Y. Dept. LB.

(35) HEAT LAMP—A 500-watt sealed-beam industrial heat lamp incorporates a new-type tungsten filament. The inside of the bulb is lined with pure polished silver that acts as a built-in reflector that never needs cleaning, since it is hermetically sealed. Amplex Corp., 111 Water St., Brooklyn 1, N. Y.

(36) SWITCHES—No. 1AH2 normally open pendant switch and No. 1AH3 normally closed pendant switch are Underwriters' listed for 10 amp., 125 or 250 volts, a-c; ⅔ hp. motor at 115 volts, 1½ hp., 230 volts, a-c. Feature compact, rugged plastic housing and hand-fitting contour. Micro Switch, Freeport, Ill.

(37) SLIMLINE FIXTURES—Available for two, three or four lights, these fixtures have removable ends for continuous mounting. Finish is Neo-Lux white enamel. Neo-Ray Products Inc., 315 E. 22nd St., New York 10, N. Y.

(38) VARICELL—Introduced by Superior Electric Co., Bristol, Conn., this unit provides stabilized and regulated source of variable d-c voltage from a-c power lines. It operates from a 95- to 135-volt, 60-cycle, single-phase a-c line, delivers a direct-current output that is variable from 0 to 30 volts. The allowable output current available at any voltage setting is 15 amp.

(39) FAN—A new line of fans announced by the Lonergan Mfg. Co., Albion, Mich., are three-purpose units—exhaust, intake and floor or table air circulator. Come in two models: a 20 in., which delivers 4,000 cfm. on high speed, 2,500 cfm on low speed; and a 24-in. model delivering 5,000 cfm. on high speed, 3,200 cfm. on low speed.

STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol Turbine Oil

UNIT Bethlehem Turbines-Falk Gears

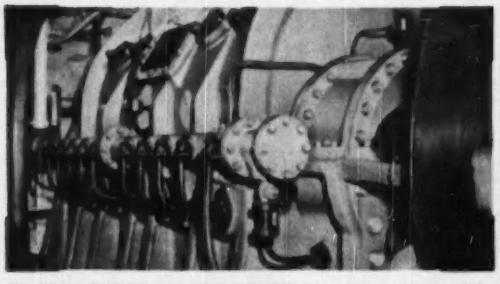
CONDITIONS 134 R.P.M.-H.P. 28,000 Max. 22½ knots max.

SERVICE 17 years-S.S. Lurline

FIRM Matson Navigation Co.

Turbine gears in perfect condition after 17 years service!

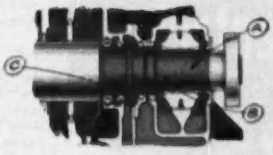
PHOTO TAKEN THROUGH AN INSPECTION PORT shows the excellent condition of turbine reduction gears in the S.S. Lurline after 17 years of service. CALOL OC Turbine Oil lubricates them. Note there are no signs of corrosion or pitting; no sludge or lacquer deposits.



RECENT CHECK OF THE GEARS disclosed practically no wear. Semi-annual tests of the charge of CALOL OC Turbine Oil show no acidity or deterioration. It filters clear. Only addition is make-up to replace leakage.

REMARKS: On inspection, Marine Engineers pronounced the gears "in perfect condition for continued service." CALOL OC Turbine Oil is recommended for all steam turbine lubrication.

How CALOL OC Turbine Oil prevents sludging, rusting and wear



A. Excellent metal-wetting ability keeps CALOL OC Turbine Oil on bearings and gears under the heaviest loads--assures constant lubrication.

B. Oxidation inhibitor resists highest operating temperatures; prevents sludge, gum and lacquer formation on parts and in oil systems.

C. Corrosion inhibitor stops rusting even in initial turbine operation, stops action of both fresh and salt water.

THE FAMOUS S.S. LURLINE, running on a fast schedule between the West Coast and Honolulu, has traveled 1,500,000 miles on the turbines and gears originally installed in 1932.

CALOL

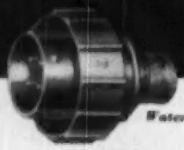
STANDARD TECHNICAL SERVICE checked this product performance. If you have a lubrication or fuel problem your Standard Fuel and Lubricant Engineer or Representative will give you expert help; or write Standard of California, 225 Bush Street, San Francisco 20.

Trademark "CALOL" Reg. U. S. Pat. Off.

STANDARD OIL COMPANY OF CALIFORNIA

Receptacles find FS-FD Pylet fixtures

Watertight Plugs and Receptacles



Watertight Plugs

WITH

TRIPLOC CONTACT UNITS

• These substantially built plugs and receptacles are equipped with Triploc contact units and are watertight for use as floodlight connections or for any other type of portable electrical equipment where weather protection is needed. Types include 1, 2, 3, 4, 6, and 8 pole units. Receptacles are galvanized cast iron with brass cap. Plugs are cast aluminum alloy with threaded nut and rubber bushing cord grip. Female contact units can be mounted in plug shell as well as in receptacle housing, as all contact units are interchangeable and reversible. For any type of outdoor plug and receptacle connections refer to your Pylet Catalog for complete listings.

THE PYLE-NATIONAL COMPANY

1384 N. Kostner Avenue, Chicago 51, Illinois

Pacific Coast Sales Office
25 Beale Street, San Francisco 4, Calif.

BULLETINS ETC.

(40) REGULATOR—The 5/8% JFR pole-type regulator designed to correct rural low-voltage conditions and improve service is described in a 12-page bulletin released by Allis-Chalmers Mfg. Co., 939 S. 70th St., Milwaukee, Wis., as Bulletin 01B6424.

(41) Motor Control—Fourth edition of the Allen-Bradley motor control catalog is a 76-page, spiral-bound booklet available from the company at 136 W. Greenfield Ave., Milwaukee 4, Wis.

(42) PORTABLE CABLE—A 56-page manual on Hazecord flexible cords and portable cables contains technical information and dimensional data on the entire range from 300-volt type SJO cord to 15,000-volt shovel cable. Tables of current-carrying capacities, resistance values and correction factors are shown. Available from Hazard Insulated Wire Works division of the Okonite Co., 72 Hazle St., Wilkes-Barre, Pa.

(43) INSULATION—Price catalog No. 14, containing information on electrical insulating materials is offered by Insulation Manufacturers Corp., Chicago 6, Ill. The 128-page booklet is divided into 13 sections: covers tapes, tubings and sleevings, varnished cloths, mica, papers, wedges, plastics, vulcanized fiber, cordage, varnishes, and other products.

(44) GLOVES—A catalog section on its various types of electricians gloves, made by the Anode process, has been issued by the B. F. Goodrich Co., 5400 E. Olympic Blvd., Los Angeles 22, Calif.

(45) CONDUIT—A 30-page catalog, No. 603, describes all types of electrical conduit manufactured by National Electric Products Corp., Chamber of Commerce Bldg., Pittsburgh 19, Pa.

(46) DISTRIBUTION—The first of three catalogs to be devoted to Flex-A-Power has been published by Trumbull Electric Mfg. Co., Plainville, Conn. The 40-page booklet is devoted to the heavy-duty LVD and SAC Flex-A-Power.

(47) MOTORS—An 8-page bulletin on Tricled high-speed synchronous motors has been published by the General Electric Co., Schenectady 5, N. Y. It is designated as GEA-5426 and lists applications for these motors.

(48) SWITCHES—A folder giving latest information on high-capacity interrupter safety switches has been prepared by Trumbull Electric Mfg. Co., Plainville, Conn., and is being distributed as TEC-10.

(49) STREET LIGHTING — Planned street lighting for public safety is the subject of a 28-page illustrated booklet available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Part one discusses the need for public safety lighting in terms of traffic safety, crime and vagrancy and civic progress. Part two is prepared to enable the reader to recognize the problem and the factors that make street lighting different from other types of lighting. The last part deals with planning a street lighting program and lists various types of lighting needs to be found in a typical community.

(50) FANS—A 60th anniversary catalog has been published by the Emerson Electric Mfg. Co., St. Louis 21, Mo.

(51) Catalog—Switches, enclosures and accessories are described in the 1950 catalog of Motors Devices Co., Canton, Ohio.

(52) WELDING CONTROL—Electronic resistance welding control equipment, both synchronous and non-synchronous, is described in booklet B-4309 from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

(53) INSTRUMENT TRANSFORMERS—Construction features of its line of instrument transformers are explained in a 12-page booklet, B-4319, offered by Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

(54) CONTROL CENTERS — Standardized control centers are described in Bulletin B-4213 prepared by Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

(55) ELECTRONIC CONTROLS—Case studies of cost saving with photoelectric and electronic controls are contained in a 68-page booklet published by Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.

(56) FITTINGS—A 12-page catalog covering solderless connectors, cable and conduit fittings and wiring devices is offered by Buchanan Electrical Products Corp., 1290 Central Ave., Hillside, N. J.

(57) SCAFFOLD—A sectional steel rolling scaffold is described in a bulletin from the Patent Scaffolding Co. Inc., 38-21 12th St., Long Island City 1, N.Y.

(58) TRANSFORMER — A dry-type transformer in a wide range of sizes for duty at the load center is the subject of Bulletin 61B6382A available from Allis-Chalmers Mfg. Co., 939 S. 70th St., Milwaukee, Wis.

Fill in the postcards on page 51

To get more information on new products and to order catalogs or bulletins mentioned in this section, fill in and mail the bottom postcard on page 51. Electrical West Reader Service is being expanded to include information on any department in the magazine. Use the second card on page 51 to ask questions or make suggestions.

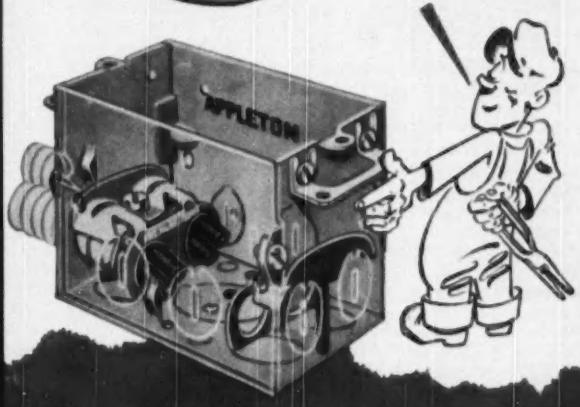
6 REASONS WHY ELECTRICIANS PREFER APPLETON FITTINGS!

1 Appleton Outlet Boxes are roomy, expertly engineered with bent-over-ears, specially designed knockouts!

2 Appleton Unilets are made of Malleable Iron... Lighter, yet tougher!

3 Appleton Unilets are smoothly finished, clean threaded, easy to handle, easy to install!

4 Appleton Switch Boxes are modern, adaptable —available in the exact type for every purpose.



5 Appleton couplings and connectors provide rigid, permanent joints, tight connections... Save time because they fit your wrench's bite!

6 There's a fitting for every Electrical requirement in the complete Appleton Line!

SPECIFY APPLETON—STANDARD FOR BETTER WIRING

SOLD THROUGH ELECTRICAL WHOLESALERS

APPLETON ELECTRIC COMPANY

1701 WELLINGTON AVENUE • CHICAGO 13, ILLINOIS

LOS ANGELES 12, 1062 S. Santa Fe Ave.

SAN FRANCISCO 7, 609 Mission Street

SEATTLE 9, 715 Ray Street

DENVER 2, 1921 Blake Street

APPLETON

CONDUIT FITTINGS • LIGHTING EQUIPMENT • OUTLET AND SWITCH BOXES • EXPLOSION-PROOF FITTINGS • BEELITES

ELECTRA'S HUSBAND

"WILL sales people ever sell again?" The question was addressed to a top-flight sales executive who was one of six people at the luncheon table. "My own experiences and those of my wife make me wonder. We've been ignored, insulted and irritated on almost every shopping expedition we've undertaken in recent months. That is, when we can get someone to condescend to wait on us."

"Hell, you ought to have a sales force of your own to boss," another of the guests said. "Our older salesmen forgot all they knew about selling during the war. The new ones never did know how to sell. Order takers, that's all they are, order takers."

"You can't put all the blame on the sales people," the top flight s. e. interrupted. "In the case of our organization part of the blame rests on management. For two years now we have been so busy with union meetings and negotiations and regulations that we haven't had time to do anything with our sales people. Of course ours is a retail store. You fellows operating distributing organizations have different problems. But even so, I'll wager that you haven't been giving your sales people the attention and help they need."

"Oh sure, we hold sales meetings at least every two weeks," the distributor's sales manager continued. "But our salesmen want us to furnish them with crutches. They think they can't make an intelligent sales presentation without help from the head office. They'd have one of us, or the regional man for some of our accounts, go with them on every call if they could."

"Wouldn't a little sales training help?" I interposed.

"I doubt it," the s. e. said.

"I know it," the s. m. interrupted. "Our men have been sales trained to death. We've trained them, the industry co-op bureau has trained them and the manufacturers are still training them. They need something else—turpentine I'd say."

"You remind me of the story of the sales manager in Portland who was beefing about his lousy sales force," another of the guests said. "His boss asked him a coude of pregnant questions—who hired 'em and who trained 'em. The sales manager admitted that he did. So then the boss asked him what the devil he was kicking about."

"Well I wouldn't go that strong," the s. e. continued. "But I do agree that something extra is needed."

"Like a good dose of religion?"

"Yes, that might help," the s. e. concluded before he began talking about the 1950 prospects for the Yankees and the Dodgers.

Some interesting material came across my desk a few days later to remind me of this conversation. It was a couple of sample copies of a new

WILL SALESMEN EVER SELL AGAIN?

service consisting of a series of weekly sales letters designed to keep sales people inspired and alert. The letters are titled "From One Salesman to Another."* During a period of 52 weeks a salesman will receive one of them each Monday morning. Usually he doesn't know that they are being sent at the behest of his employer.

Here are some quotations from the first letter in the series:

"Some of you oldtimers (prewar) may notice a vague similarity to something you heard in the dim distant past but even you will be shocked at its newness today. You youngsters (postwar) will find things you never knew till now.

"All of us have discovered that the days of 'helping the prospect to buy' are done gone and the time to *sell the suspect* is now with us. Just as we remove the red flannels in the spring, it's now time to shed some frozen practices also.

"From here on it is suggested that all 'order takers' transfer to the rear ranks. Only one excuse for not buying is recognized by a top performer . . . 'Haven't a dime to my name and am taking bankruptcy tomorrow.' Under these circumstances only may a competitor have the privilege of trying."

After the first explanatory letter, the series really gets down to brass tacks selling in a homely style. Excerpts:

"SALESMEN are made . . . not born. Admittedly some are developed inadvertently — but nevertheless they are *developed*. At your age it is unlikely that you can change personality overnight and furthermore, in contravention of everything you have ever heard, it isn't necessary. *There is no such thing as a sales personality.*

"There IS sales training, sales experience and the resulting sales ability. . . . We are all at this time having sales experience of one kind or another. Let's apply to that sales experience some 'sales tips' and watch our volume soar.

"Tip No. 1. Forget your product when talking to a prospect! Remember that the man in front of you hasn't a mutual love for your item or service. He's only interested in what it will do for *him*. Think only in terms of results for him, speak only in terms of results for him and you'll end up obtaining results for yourself.

"Tip No. 2. Forget the price of your product! You are probably more afraid of it than your prospect. In the case of business, it isn't how much they are laying out—it's how they will get it back—and how soon— and how much in addition. In non-business it's 'how can I pay for it'—not the total. You saw the recent cartoon in which the lady says, 'I took the better one—it didn't cost any more—we just pay for it a little longer.'"

There were a couple of lines in this particular letter that Electra enjoyed when I let her read it. And here they are:

"Always when selling, your business is GOOD . . . GOOD . . . GOOD."

"When you walk up to a prospect, you are about to do him a favor."

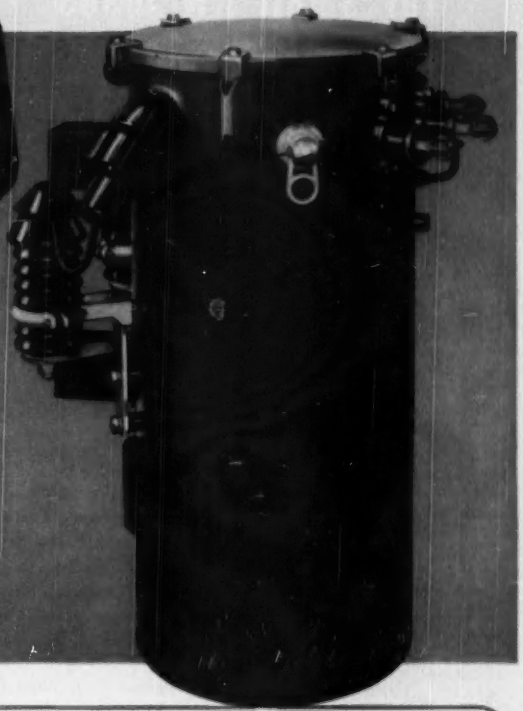
Most of the sales people we have walked up to recently think we are about to do *them* a favor.

Sometimes I wonder too how much of this indifference is prompted by all of the "security" that unions, government and socially minded employers have protected the sales person with since the last time selling was a necessity. Security is devoutly to be wished, of course, but doesn't it dull the edge of initiative? We are all human, after all. Necessity is the whip of enterprise, isn't it?

*The Marketing Institute, Board of Trade Bldg., Chicago, Ill.

HERE'S WHAT WE MEAN BY *Premium* PROTECTION

...on ACP* Transformers



1. **CIRCUIT BREAKER** protects against all secondary overloads and short circuits . . . fully utilizes short time overload capacity of transformer.
2. **LIGHTNING ARRESTERS** externally mounted provide overvoltage protection . . . expulsion or valve types.
3. **BREAKER RESET HANDLE** provides safe, easy means of energizing load.
4. **SIGNAL LIGHT** indicates when transformer has entered into the maximum safe operating band . . . stays lit to provide visual check on loading.

*Allis-Chalmers Protected *ACP* is an Allis-Chalmers trademark.

WHEN YOU INVEST in transformer protection — and want the *best* — specify ACP transformer *premium* protection.

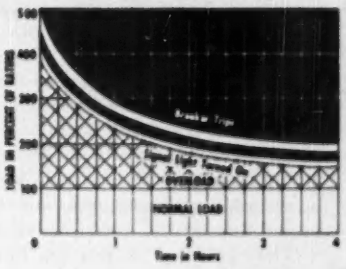
Secondary breaker, high voltage protective links and lightning arresters are coordinated to give full electrical protection. Transformer and protective equipment are completely packaged to give you reduced installation costs, simplified stocking.

For details on premium protected ACP transformers, contact your nearby A-C sales office. Or write direct.

A-2945

How ACP Transformer Utilizes Overload Capacity

Breaker is actuated by either excess load current, oil temperature, or both. Coordination of these elements with thermal characteristics of transformer puts overload capacity to work (see typical curve for ACP transformer at right).

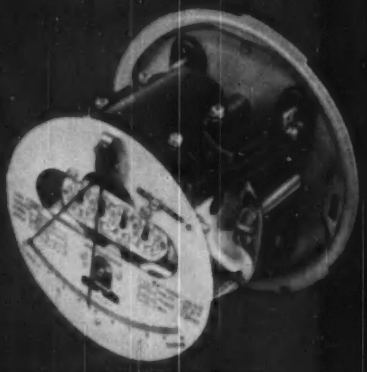


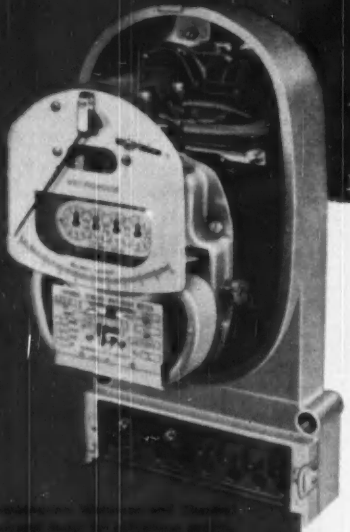
ALLIS-CHALMERS, 939A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

Demand metering for small KW loads now economically practical for

SINGLE OR POLYPHASE CIRCUITS





Economical demand metering now can be applied to both single *and* polyphase circuits . . . even where the load is small! Westinghouse combines Thermal Demand Meters and Watthour Meters into a *single* unit. Only one mounting is required. Installation is greatly simplified.

These *two-in-one* meters answer your need for Demand Meters with low maintenance characteristics . . . to *economically* meet the continued extension of demand rates to smaller loads. Standardization and simplified design make possible a low first cost. Many parts are the same as standard Watthour Meters. Stocking is simplified.

If your problem is *economical* demand metering for kw *or* kva loads . . . single or polyphase circuits . . . investigate Westinghouse Meters. They provide the information accurately *and* economically. Write for C.S. 42-337 and C.S. 42-338. Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Penna.

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PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Watthour and Demand Meters for Any Job

MARCH, 1950 Vol. 104, No. 3

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

MOVIES WOO GOOD WILL

A. James McCollum
Publicity Supervisor
Pacific Gas and Electric Company

MOTION pictures have two important callings in addition to box office entertainment as symbolized by the glamour and spectacle of Hollywood. These callings are in the fields of education and public relations.

Training films are a relatively new development. They were barely out of the incubator at the beginning of World War II. The war itself brought them into wide use as a training technique. The armed services, faced with the biggest rush-order training program ever undertaken, found the motion picture to be the most convenient, the most practical, the most painless and the fastest method of converting hundreds of thousands of civilians into soldiers, sailors and marines, many with specialized training. Movies, of course, could not do the job alone, but they contributed tremendously to the whole training project.

After the war the school systems of the nation were quick to take up the idea. Most schools of any appreciable size today have audio-visual education sections. In California, it is a rare school that does not own a movie projector and maintain a film library.

Industry also is catching on to the idea. Training classes for the personnel of large companies pay substantial dividends to employees and employers alike. Subject matter runs from safety principles in the factory to themes on how to make a customer happy though paying a bill.

The other important extra-entertainment calling of motion pictures is in the field of public relations. In this field, too, the significant development has been made in recent years to the point where today films are a proven tool of the trade. But, as in the field of education, the movie is only one of several tools in the kit. Public-relation-wise, motion pictures are part of a team that includes various other media.

Using the public utility industry as an example, and particularizing the Pacific Gas and Electric Co. film program, which we believe is unparalleled in the utility industry, let's look into the public relations mission and the motion picture as one ball carrier on the team — a backfield ace, if you please.

Current PG and E Films

Sierra Fish and Game—public relations message: how hydro development helps preserve sportsman's paradise.

Snow — importance to public welfare of snow pack and captured runoff; utility's battle against storms to maintain electric service.

Junior Grand National—public service gesture of making documentary film available to help California's farm youth in his program of "learning by doing."

Hired Hands — the contribution of electricity to California agriculture.

Hydro—description of hydro-electric development.

Kilowatt Builders — review of company's vast postwar expansion program.

Whirling Wheels—electricity's role in California industry.

Industries of a Fruitful Land —how gas and electricity help produce, process and pack California foodstuffs.

Sutter's Empire—scenic tour of Sacramento Valley and surrounding foothill areas including landmarks of state's early history.

Port of Many Harvests — a survey of the rich agricultural, mining and other resources of the region around the inland port of Stockton.

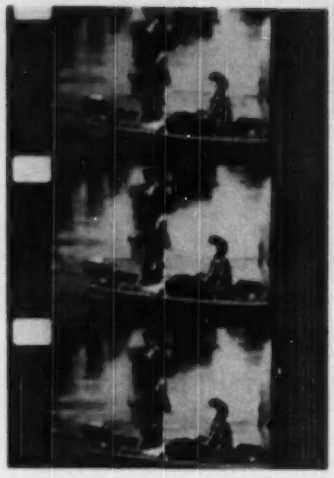
A Power House is Built — principal phases of constructing a modern hydroelectric power plant.

Miracle Flame—the story of natural gas, its history and its modern uses.

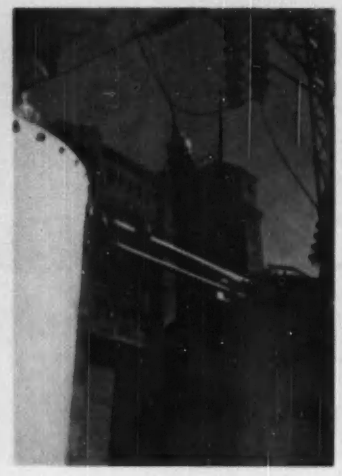
Good public relations is especially vital to the public utility. It is significant that the word "public" appears in both "public utility" and "public relations." Utilities serve everybody in the public, and the whole public's good will toward them is a basic necessity. Without it, an electric utility would have a difficult task indeed these days countering the propaganda and otherwise withstanding the encroaching aims of the political ownership gang which long has cast its eye at the power industry.

Public relations is what we do to court the public's good will. Don Herrold, in his newspaper column, once described public relations as the nasty letter we don't write when we're mad and the nice letter we write the stinker the next day after we've regained our sense of humor. Sometimes it is that, to be sure, but the mission is much broader. It's what we do as a company and as individual employees of the company and how we act in every brush the public has with us. It's good service; it's adequate and dependable supply of gas and electricity; it's reasonable rates; it's the friendly manner of the meter reader, the clerk at the counter, the serviceman and the telephone operator; it's all these things and many more.

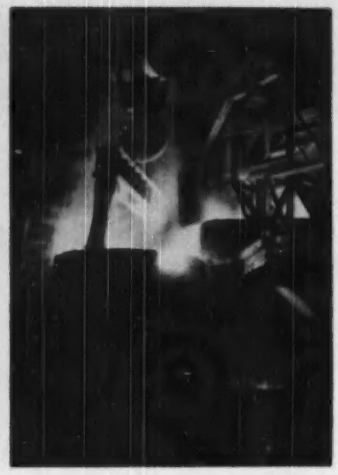
John Q. Per Capita doesn't always recognize our qualities. He's prone to listen to the persistent critics who usually have a special ax to grind. So we can't wait for him to come to a realization of our virtues. We have to "toot our own horn." That's where the first string, the professional public relations team, comes into the game. It's not the football platoon system either, for all the other players—the company's entire personnel—still must be on the job with good service, courtesy and a sincere desire to give the public more than its money's worth. The first string has several effective tools, among them publicity, newspaper and



Screens from "Sierra Fish and Game"



A still from "A Power House is Born"



"Whirling Wheels" has shots like this

magazine advertising, radio, billboards, lobby displays, direct mail, luncheon speeches and motion pictures.

PG and E uses or has used all these tools of public relations effectively. In the public utility industry as a whole, PG and E perhaps can lay claim to preeminence in use of the motion picture medium.

The company started making movies 30 years ago when they were indeed in the pioneer stage of development. The first efforts—in the early 1920's—were 35-mm black and white sequences of hydroelectric construction projects on the Pit River. A cameraman was engaged to film phases of these projects and the sequences were assembled with maps and explanatory material into reels to be shown principally to stockholders and company personnel.

The 35-mm motion picture field was and is Hollywood's. The notion came early—a result of the Hollywood influence—that motion picture in 35-mm had to be lavish to be good. Thirty-five millimeter equipment was expensive. Eventually 16-mm and 8-mm equipment was developed primarily for amateurs. Since the cost of producing 35-mm movies for anything but "box office" was virtually prohibitive, commercial film producers turned to and developed the 16-mm field. It offered more economic production, wider distribution possibilities and a fertile field for industrial use.

In 1935 PG and E began to explore 16-mm films as a public relations medium. The first sound movie, produced in 1936, was entitled *Behind Your Electric Switch*. It told the story of generating and distributing electricity. The company's publicity department wrote the script and directed the filming; a commercial studio supplied the cameraman and the technical know-how. The initial public showing was at the California State Fair in Sacramento where the company erected a miniature theater in a portion of its exhibit space. Distribution of the movie at the fair and also around the system met with favorable reaction and convinced the company that the motion picture had possibilities in public relations.

At about the same time PG and E made a series of three silent pictures. The narration, instead of being recorded on sound-track film, was spoken by the person showing the picture. The three silents were the beginning of a plan to produce one picture for each of the 13 geographical divisions of the company, telling of the utility's contribution to the agricultural, mining, industrial and commercial development and the civic life of each division.

The divisional pictures were made to be shown in their respective divisions, but it soon was discovered that the demand for each of the films was system wide. Audiences in coastal areas were interested in how fruit was raised and packed in the Sacramento Valley; lumbermen in the north enjoyed the scenes of industrial activity in the metropolitan areas, and so on.

The next year — 1937 — PG and E went into movie-making in earnest and employed its own full-time movie cameraman. Like the man who came to dinner, he is still here—Jon F. Stanton. Every film produced since 1937 is a product of Stanton's talent. At about the same time, the late Al C. Joy, manager of the publicity and advertising department, hired a young man named Robert R. Gros for general duty in the department. (Gros succeeded Joy as manager of the department in 1943). Joy turned these two capable young men loose on movie making. Their first efforts were admittedly amateurish, but their films did a fine public relations job and laid a firm foundation for the company's movie program as it exists today.

Their first production was *Blossom Land*, released in 1938, a story of agriculture in the San Jose division. Later in the same year they completed *Sierra Playgrounds*, telling the story of hydroelectric power development and the company's public service practices in water conservation and fish and wildlife preservation. This picture has been the most popular of all PG and E films to date. It still is in demand, but became so outdated that it finally was retired last year. It has now been replaced by a new movie on the same subject, entitled *Sierra Fish and Game*. The new film was shown for the first time on Feb. 1, 1950.

A preview was given before the fish and game editors of the San Francisco Bay area newspapers and radio sportscasters. In columns and programs which followed they unanimously proclaimed it one of the best motion pictures ever produced on sport fishing in California. The movie has some of the most spectacular fishing and wildlife shots ever recorded by the camera — including an underwater sequence of a rainbow trout fighting a fisherman's fly, a mass flight of tens of thousands of ducks, and a water snake, a serious enemy of trout, swallowing a fingerling.

Being a fishing enthusiast himself, Stanton always takes his camera with

Such scenes from "Hired Hands" show uses of electricity in agriculture

Lynn Gleason in "Jr. Grand National"

him to his favorite fishing spots. The new movie, three years in the making, includes sequences which no movie-making expedition could stage. As in fishing itself, sometimes the cameraman has luck and sometimes he doesn't. There are several rare shots in *Sierra Fish and Game*,, obtained through perseverance to be sure, but impossible without luck.

By 1940 the public relations value of PG and E movies became fully apparent and, by trial and error as much as anything else, we discovered a sound formula of subject matter and treatment — and an approach to the public which made our films acceptable to virtually any audience.

Since then we have come a long way. Every year in the last decade we have won either the first or second motion picture award in competition with all the electric utilities in the nation. In all cases we were in competition with commercially produced films costing three to five times as much.

Today PG and E has an unusual and remarkably successful film program. The older films have been retired and in some cases replaced with more recent versions. There are twelve current PG and E-produced films with several prints of each and as many as a dozen prints of the more popular ones. Once a movie is produced, it is only an incidental expense for each additional print, or "dupe" as it is called in the trade. However much a 30-minute color and sound movie may cost to produce, prints cost only $150 to $175 each.

The company owns 20 sound-equipped movie projectors and screens, with at least one in each division, and there are several projectionists or operators in each division. These operators are chosen carefully from a public relations point of view. When they go to a service club, school or church to show one of our movies, they represent the company. They are a splendid group of young men — and they all do a good public relations job.

A movie booking service is maintained in the publicity department which occupies the full time of one woman employee. She books 88 prints out of her office at present, and in 1949 the company averaged 412 bookings per month. The high month in 1949 was March with 576 bookings.

The University of California film library permanently retains 12 PG and E movies which it books heavily, principally for school audiences.

In addition to its own movies the company has prints of several films on the electric industry or private enterprise generally which it offers to the public through its distribution system. Among these are films produced by General Electric, Westinghouse, the Good Housekeeping Institute and the Pacific Coast Gas Assn. The PCGA film, *Miracle Flame*, was principally produced by the PG and E publicity department for the association.

In 1949 the company produced and released three new movies: *Snow*, *Kilowatt Builders*, and a full running story, *March of Time* style, of the 1949 Junior Grand National Livestock Exposition.

Ten prints of *Sierra Fish and Game*, the first production of 1950, already are in circulation. Three others currently are in progress for release this year: a revision of *Kilowatt Builders*, bringing the company's big postwar construction program up to date; the 1950 Junior Grand National, and an account of building the "Super Inch" gas line.

The company can afford to make three or four movies a year because it produces them in its own shop with its own talent. The movies are planned, written, directed, filmed and edited in the publicity department. The sound work and some special effects are done by commercial movie organizations. As a general rule PG and E can produce three 30-minute movies itself — in full color and sound—for less than the price of one in the commercial movie market.

The cost of movie production is well invested, provided, of course, the film meets the proper standards of showmanship, photography, objectivity and entertainment. These standards simply are a common-sense approach to the public. The subject matter must be interesting; there should be educational value; the "commercials" must be honest and as inconspicuous as possible, and the presentation must be in good taste. On the other side of the equation, there must be sufficient public relations value in the story the film tells in order to justify the company's investment in producing and distributing it.

Our pictures are shown to women's clubs, church groups, lodges, farm organizations, labor unions industrial groups, schools, service clubs, Boy Scout troops, etc., and, in the rural areas, to community-wide meetings.

One mechanical consideration in producing movies is that they should be no longer than 30 minutes, and preferably around 25 minutes. This is so they can be booked on the service club circuit — where businessmen

want a program with their creamed chicken, carrots and peas and committee reports. The normal practice of luncheon clubs is to allow a half hour only for the program of the day. As long as industrial films are tailored to size, presuming the movies are otherwise acceptable, they can be booked before luncheon club audiences which include most community leaders.

As long as our films are educational, objective in treatment, and clean of offensive commercial promotion, they will continue to be acceptable to the public schools, in which we make numerous showings year after year throughout our service territory. There is no other medium which can carry the company's story so effectively to school children. Our story, and the over-all story of private enterprise, too, has little opportunity to reach school children through other media.

Sometimes films tell PG and E's story far beyond its own service territory. For instance our films have been shown many times in schools outside the area we serve, purely as educational movies. The U. S. State Department has shown an interest in our films for telling the American story abroad. Just a few weeks ago we received a request from an educational film organization in Bombay, asking to purchase prints of two of our films to show to Indian audiences. San Francisco television stations have televized several PG and E movies on sustaining time as public service gestures on the part of the stations.

No single public relations medium, whether it be newspaper advertising, billboards, radio or what, can do a complete job by itself. Each has limitations. No single medium can do a better job within its limitations than the motion picture. So long as it is good and does an entertaining or educational job, the movie holds the undivided attention of the audience. A good movie creates a lasting impression in the minds of the people who see it, and our message "gets across."

On the limitations side, movies are not as versatile nor as massive in appeal as most other media. It is not practical to have more than a limited number of projectors and prints available, hence it is necessary to book films on a first-come, first-serve basis. PG and E program has been established for so long, that most groups realize this situation and book films far in advance of their showing dates.

"Snow" has such scenes as this one of crew repairing Hendricks Canal break

Another limitation is the relatively small percentage of a community's population that attends clubs, lodges, etc., where movies may be shown.

Still another limitation of movies, in comparison with other media, is that they basically are confined to so-called "low pressure selling." They can't do a high-pressure selling job, like newspaper advertising, to build load by "plugging" electric blankets or electric coffee-makers. The simple reason for this limitation is that an organization which seeks a film for entertainment purposes would not accept a dressed-up "soap opera" commercial. If we should try it once, we'd be unlikely ever to reach that audience again.

There is a basic public relations value in our movie program that is not immediately apparent. That is the mere fact that we offer, free of charge, good movies to organized groups throughout our service territory. Furthermore, we don't stop with offering the film. If we are given sufficient time to fit a program into our booking schedule, we not only make the film available but we also send a projector, a screen and an operator. The operator sets up the equipment, runs the movie for them, and packs it up after the show. There's no strain, no pain for the program chairman. All we ask of the group is that a simple form be filled out setting forth the name of the film, the type of audience, the number attending and any favorable or unfavorable comments the group may have. These data are valuable to us in gaging the effect of our films and planning future ones.

There is another value to this public relations medium. Movie-making has a glamour to it. People become enthusiastic and a little excited when movies are being made in their home town or neighborhood. When we shoot pictures around our service territory—in Eureka, Coalinga, Grass Valley or Buttonwillow — everybody, including the community itself, likes to get into the act. When our movies show the main street of a community and mention it by name, the local paper makes a news item of it and community pride swells. It helps promote a warm feeling toward PG and E. And you can be assured that the whole town turns out to see the finished picture . . . and incidentally they hear our pitch.

We do not promote audiences. We don't solicit opportunities to show our films anywhere. They come to us asking for an opportunity to see our movies. In effect we are doing these groups a favor by providing them a program. Public relations just can't do a better job than that. The public's respect for our films, which makes such a situation possible, has had to be earned. If our pictures were not good entertainment with educational value, they'd go begging for an audience.

The booking statistics for last year are one "yardstick" for measuring the effectiveness of our film program. In 1949 alone we showed films to 4,946 audiences of 20, 30, 40 and sometimes 100 people — averaging 412 showings a month. The total attendance at these showings during the one year was 436,628 persons. We had each one of them — nearly half a million people — in a dark room for half an hour during which they could see nothing or hear nothing except what we had to tell them. No other public relations medium can "relaish" the public any better than that.

Visual acuity using telebinocular (left) and distance judgment by aligning small cars (right) are part of driver's tests

We Test Our Drivers to Reduce Accidents

Says

Clayton M. Allen

Los Angeles Department of Water & Power

BY the application of a little old-fashioned philosophy to a modern problem the power system of the Los Angeles Department of Water & Power has been able to reverse a twelve-year upward trend in accident frequency rate and start the trend downward. To reduce accidents, the cause must first be determined. This fact was fully recognized by supervisors of the general plant division in charge of the power system fleet. This fleet is now composed of 1,900 cars, trucks, and units of construction equipment. We were convinced that the solution to our problem of increasing accidents was in education, and that if as a result, our employees understood the *know why* and *know how* of driving, and their own deficiencies, they would do something about it.

Our accident record, both as to frequency and severity, was generally accepted as a good one however, observation of accidents reports clearly indicated that many preventable accidents were occurring. Long and fair trials had been given to a system of charging employees for the cost of repairing damaged department equipment. Then for ten years we operated under carefully drawn rules and regulations for the care and operation of automotive equipment which contained a system of demerits for negligent drivers. Neither of these measures improved the situation, however. Our accident rate was still on the increase.

Testing Program Set Up

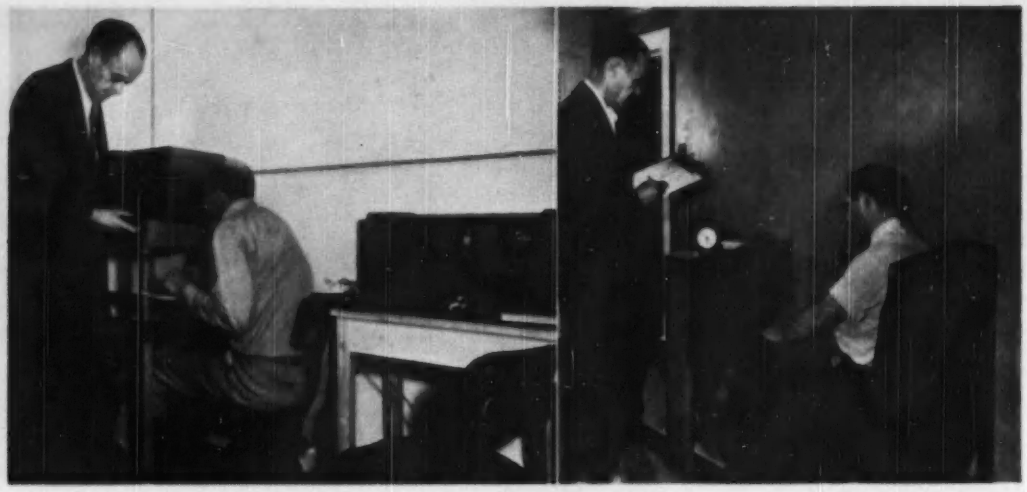
Consequently, and as a supplement to the committee-administered existing rules and regulations, in March 1946, there was inaugurated a check of those employees driving power system vehicles. After first verifying that the employee had a valid motor vehicle operator's license, the instructor rode with him over a predetermined course and graded his ability to drive. Drivers were checked for their observance of laws and ordinances pertaining to vehicle operation, and for their *horse sense* in safety and accident prevention. At the end of the run, the instructor's observations were discussed with the employee and suggestions made for his benefit as well as the department's. This check and brief instruction was very satisfactorily received. It was established that our employees were not only responsive to instruction and education but that they welcomed it.

In April 1948, the general plant division began the installation of driver testing and education equipment to determine driver deficiencies. The accompanying photographs show major pieces of this equipment.

Physical testing was first initiated in the truck driver group on a voluntary basis. The idea was to make them aware of their driving capabilities and shortcomings. Acceptance of these tests by regular drivers was very well received. Word soon spread and many driving employees were taking advantage of the tests. Except for those employees whose duties require regular driving, the tests are mandatory only for those who have had two accidents, negligent or not, in two years.

Type of Tests

It takes about two hours to complete the test course. Tests given in the laboratory include steadiness, distance judgment, side vision, hearing, night vision, glare resistance, glare recovery, visual acuity, color confusion, and simple foot-braking reaction time. Following the laboratory tests, the employee is taken on a five-mile road run which is terminated on the concrete bottom of the Los Angeles flood control channel. Here, the



Stop watch is used on glare recovery test (left). At right is shown apparatus for making the brake reaction test

testing merges with education.

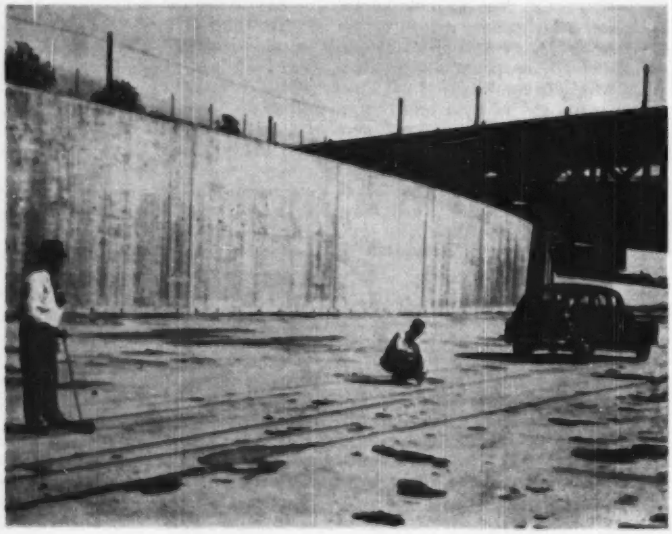
The employee personally makes measurements of his reaction-time and braking distances. Reaction-time distance is the distance the car travels during the time the employee observed an emergency and decided to stop, or until he got his foot on the brake. His braking distance is the distance it took him to bring the car to a stop after he applied the brakes. The sum of these distances is the distance it takes him to stop under the most favorable conditions after observing an emergency.

The brake reaction detonator used to determine these distances is a simple device, employing two .22 caliber blank cartridges filled with colored powders. One barrel is arranged to be fired at the will of the instructor and unobserved by the driver as they are riding along. The deceleration the instant the brakes take hold causes the detonator to swing and fire the second .22 blank, making another mark at this point. This is the end of the reaction-time distance and the start of the braking distance.

As the car comes to rest at the end of the braking distance, two measurements are made. First, the driver's reaction-time distance between the two marks. This is the distance traveled during the time the foot is transferred from the accelerator to the brake. The second is the vehicle braking distance. This is the distance between the second powder mark and a point directly beneath the detonator. The sum of these two distances is the total stopping distance.

An employee with a .75-second reaction time, the national average, driving a car 30 m.p.h. or 44 ft. a

Side vision testing apparatus (left). Detonator stopping test, shown in right view, is the most important test of all



second, will travel 33 ft. during the time he is getting his foot from the accelerator to the brake, before braking starts. After the brakes are applied, the car will travel a certain distance before it can be stopped. This depends upon the friction in the brakes and the adhesion or friction between the tires and the road. The average department employee tested with a reaction time of .61 second has been stopping our test car at 30 m.p.h. on a smooth concrete pavement in 27 ft. reaction distance and 43 ft. braking distance, or a total of 70 ft. stopping distance.

Detonator Test Most Important

While all of our laboratory tests have had their beneficial effect upon our employee driver, the real and practical brake detonator test has had far greater effect than all the others combined. We have lowered the driver's ego—changed his attitude. This is credited with being a 60 to 90% factor in safe driving. We have secured the driver's sincere interest in defensive driving. He has learned the relation of speed to impact force.

A lecture on the laws of motion as applied to moving vehicles follows. The stopping problem the driver demonstrated in the detonator test is actually worked out by simple distance, time, and velocity formulas. Blackboard problems clearly illustrate how the stopping distance and the destructive force, in event of a collision, increase as the square of the vehicle speed. Also, typical intersection and following-too-close problems are solved. An employee completing the tests and instruction course is aware that he has such a thing as *reaction time*, and how necessary it is to make allowance for it and other factors. If the instructor finds that an employee has physical defects that make it unsafe for him to operate a motor vehicle, the report of test is sent to his division head with the recommendation that he be "grounded" until corrective measures are taken.

Our driver instruction and road testing program was started a little less than four years ago. At that time our power system fleet accident frequency was at its highest, just double that of twelve years previous. During the past three years, with the addition of physical testing and education in fundamentals, the accident frequency has been gradually reduced to a point lower than it has been for the past six years. This decrease has occurred during a period and in an area that has the greatest concentration of automobiles in the world. There is a vehicle for every 2.5 persons in Los Angeles.

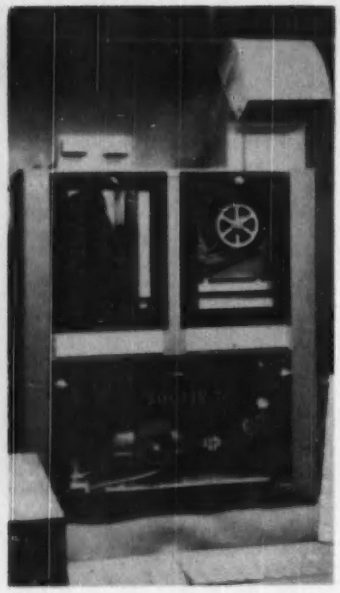
We are reluctant, however, to make a positive statement that our driver instruction, testing and education has been solely responsible for such a fine record, although we believe it to be so. We believe that our philosophy played its part. We are convinced that our employees, who have been tested and exposed to education in the fundamentals and laws of motion, will play a large part in assisting us to accomplish our objective of eliminating accidents or lowering them to an irreducible minimum.

Cloud (left) seeded with dry ice produces "bonus" snowfall. Water shed at right produces 12 to 14% more power

DRY ICE CLOUD SEEDING MAKES IT SNOW

Seeding of clouds with dry ice has increased natures snow crop by 12 to 14% during the past two winters in the watershed supplying hydro plants of the California Electric Power Co. This application in California's High Sierra is the first commercial attempt at aerial cloud seeding for power production. Twenty-one flights over a 210-day period were made. A "bonus" runoff of 6,500 acre-ft. of water was obtained. This is equivalent to 14,300,000 kwh. Cost for operating the P-38 seeding plane was approximately $200 an hour. Cost of producing the 14,300,000 kwh. by steam would have been $56,000.

Albert Cage, CalElectric president, believes that aerial seeding was primarily responsible for the company's ability to keep its hydro plants operating at full capacity despite the California dry cycle of the past several years. Trial cloud seeding was given no publicity mainly because there is yet no legal decision on whether seeding operations "steal" power resources from others. However, the utility has built up data proving almost beyond doubt that, had the power-potential clouds not been tapped, they probably would have dissipated themselves over the mountains.



Trenching machine (left) used in laying coils for heat extraction from the earth. At right, commercial package unit

Heat Pumps and Heat Sources

U. G. Smith*

CURRENTLY there is great interest in the residential heat pump. There are two important reasons for this. First, because of conservation of energy, and second, because the heat pump is the most practical method of noncombustion heating other than resistance electric heating.

Heat Pump Economics

The first cost is objectionable but must be judged on a long-range basis. The only type of fuel with which the heat pump can be compared is noncombustion or resistance electric heating. Only electric furnaces approach the heat pump in temperature control and comfort. Based on a first cost plus a 20-year operating period, the heat pump will show a considerable saving in most cases. Using 65,000 B.t.u. heat loss requirement for a home, a 19-kw. electric furnace would be required, or a 5-hp. heat pump. The heat pump would require not less than 30 lb. low-side pressure, using Freon 12 refrigerant. First cost on the electric furnace would be from $850 to $1,100 depending on duct costs. First cost on the heat pump would range from $2,800 to $4,000 depending on duct and well costs. For sake of simplicity, the electric furnace installation can be considered to cost $1,000 and the heat pump $3,500.

Operating costs cannot definitely be predetermined, but one per cent for repairs per year is a fair estimate. Using one cent per kwh., the electrical energy for the electric furnace would cost approximately $4,800 for 20 years. For the heat pump the cost would be approximately $1,230. Total 20-year cost for the electric furnace would be $6,000. For the heat pump the cost would be $5,400. This is with a summer cooling system figured at no cost except for energy. If a cooling system were figured as being added to the heating system at $500 per hp. (accepted average), the heat pump would then show a 20-year cost of only $2,430. This is a savings of $3,570 over the electric furnace. Considered either way the consumer gets more for his money with the heat pump.

Climatic conditions do not affect the heat pump except in first cost. If properly installed and sized, —60°F. is no worse than +30°F. Improperly engineered, a heat pump would not work in either case. However, it may be impractical at —60°F. due to excessive high first cost.

The present stage of development of single-phase electric motors, compressors, refrigerants and equipment accessories is behind the needs. A 5-hp. capacitor-start motor has not been placed on the market to the knowledge of the writer. A small, quiet centrifugal compressor must be developed for the heat pump and with it perhaps a new refrigerant. Most accessories for normal refrigeration work must withstand only 100-lb. pressures, whereas heat pump work normally requires from 150-lb. to 200-lb. pressures.

Heat Sources

Outside air as a heat source is very practical as the only heat source in some sections of the southern part of the U.S.A. In other parts of the country and in Canada air is entirely practical as a second source of heat. It may be used where the ground coil method is employed in a smaller earth area than would support the needs of the heating system for the entire year. The author has used a combination heat source on three heating units successfully.

The trouble encountered in controls and apparatus for defrosting, and low heat output where frosting of the air

* Taken from a presentation before Business Development Section of the Northwest Electric Light & Power Assn., Salt Lake City. Mr. Smith is a prominent heating and ventilating contractor in Portland.

coil is encountered, sets the practical minimum outside air temperature at approximately 37°F. On the machines tested the back pressures ranged from 18 lb.—32 lb. using Freon 12. Each machine varied with the outside air temperature, i.e., 18 lb. at 37°F. and 32 lb. at 65°F. The total volume of air required was based on not more than a 4°F. drop in entering-to-leaving air when using minimum temperature outside air.

Earth As Heat Source

The ground coil as the only heat source presents the greatest problems. Yet ground heat is universally available. The author has arrived at some conclusions that cannot be backed by scientific findings. Only experience points to the following conclusions.

Heat units available from the earth are 7,200 to 10,000 B.t.u. per year per sq. ft. of earth surface. From 10 to 15 B.t.u. per linear foot of tubing per hour are within the practical range of heat extraction. One-half inch O.D. copper tubing, type L, is adequate to remove all the heat from the surrounding earth that should be removed during a heating season. A standard of 30 to 60 B.t.u. per linear foot of tubing is a myth created by short tests. Such values are not of a practical nature based on two or three years of operation. What is taken out of the ground in heat units must be put back each year. The above figures are based on 35 to 45 in. of rain a year, and on other climatic conditions existing in areas similar to Portland, Ore. For all practical purposes, any heat gained from the center of the earth must be disregarded. It is of such small quantity that its value will only provide a safety margin.

Undersizing either the ground coil in relation to machine size or the heat pump in relation to the demands of the home is disastrous. Continuous operation of a machine reduces its efficiency and output. The layout of the ground coil needs more practical experiments.

Dry earth is impractical unless artificially soaked with the equivalent to 35 to 40 in. of rain. The practicability of such a process remains to be determined. Contrary to other statements and beliefs, the author firmly believes the 50x100-ft. city lot is not nearly enough ground to support even a 3-hp. heat pump. By the time a house, garage and sidewalks are laid down, less than 3,000 sq. ft. are left available for the ground coil. Using four sq. ft. of earth's surface for each linear foot of tubing and 1,800 ft. of tubing for a 3-hp. heat pump, 6,200 sq. ft. of earth's surface would be required. However, the city lot may yet be able to support the average house by the addition of heat added via wasted water from bathwater, wash bowls, laundry, etc., or by using air as an auxiliary heat source. The author has used the air and ground combination successfully.

Water As a Heat Source

Lakes, rivers and slow streams are poor sources of heat. When most needed their temperatures are the lowest. As a result the machine's output drops when its output should be at a maximum. Wells and fast even temperature spring-fed creeks are fine. The streams may drop to as low as 42°F. where the evaporator is laid in the creek bed. Well water should not be less than 48°F., with water chillers for heat transfer. Water chillers may have deposits on the surfaces and thereby have their efficiency reduced as the deposits become thick. In some places it may become necessary to clean them quite often. The author has used city water and air as a combustion. Its practicability remains to be determined from the economic standpoint. It does give satisfactory operation.

The Future

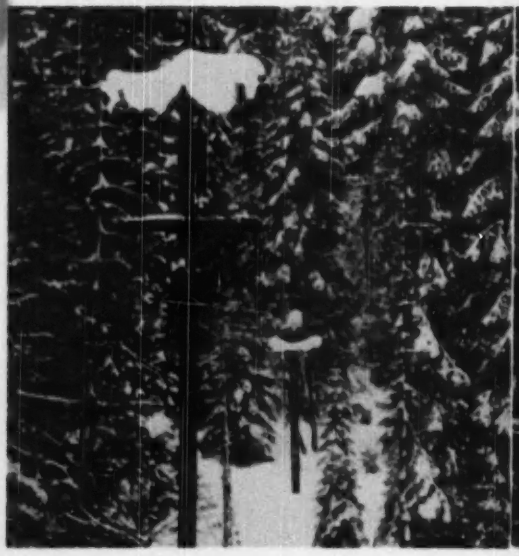
Five, six, eight and ten horsepower heat pumps per home will be more common than 3-hp. units. The majority of these will be in the suburbs or rural sections. Five to ten per cent of new homes costing $20,000 and above probably will use heat pumps, five years from now when the newness has worn off and they become more practical.

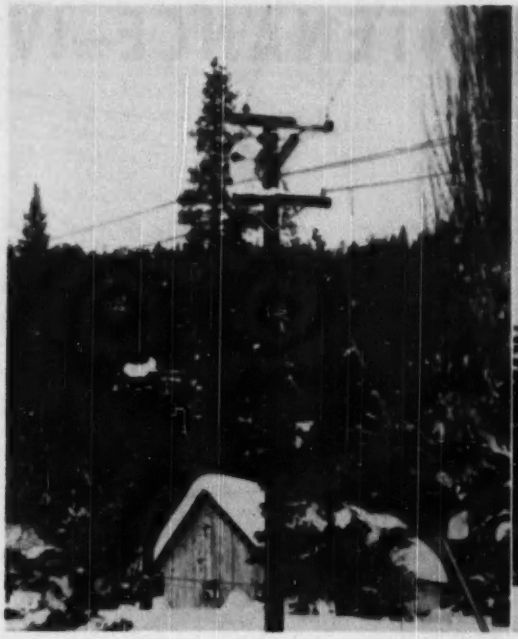
Three to five years from now may develop city lots as a practical heat source by the addition of waste water passed through grease and refuse traps and then evenly distributed over the ground coil. Wells and air are at present the best sources in their particular spheres. The heat pump is a conserver of the nation's resources.

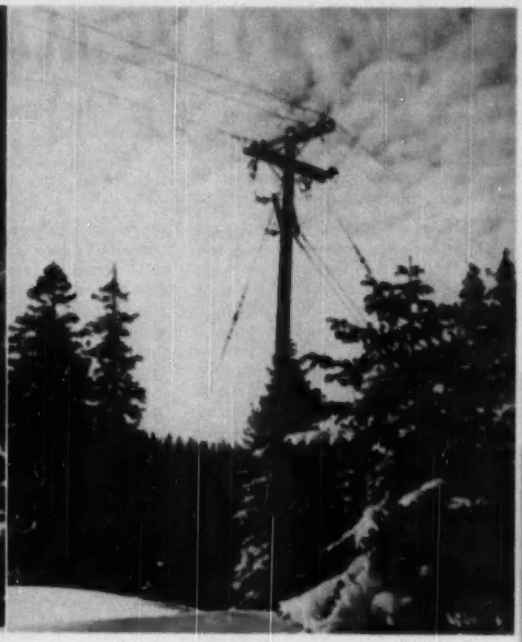
Commercial residential heat pump unit

Accompanying staff photographs show several views of heavy snow loading on a 12-kv. rural line and some of the construction features of the line. Note the heavy guying, armor rodding of conductors, vibration dampers

Rural Line Withstands Heavy Storms





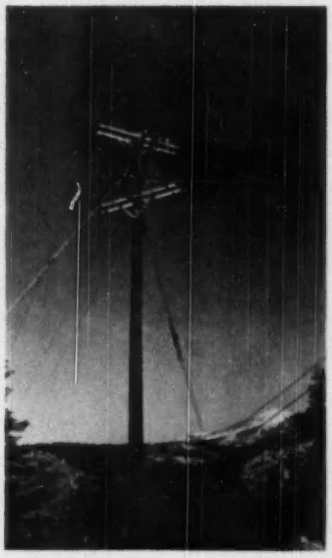


DURABILITY and a desire to keep everybody happy were the primary considerations in building a rural distribution line to serve the High Sierra country along Highway 50 in central California. The line traverses a distinctly heavy loading area. Moreover, the Pacific Gas and Electric Co. was confronted with very limited right-of-way clearing for the 45 miles of 12-kv. line constructed.

The line serves resort country along the American River. It starts at Pacific House above Placerville at an elevation of about 4,000 ft. and terminates at Echo Summit, elevation 7,335 ft. There are 31 miles of main line, 7 miles of 12-kv. primary laterals and 7 miles of secondary serving over 400 meters. Proof that it paid to provide extra strength in the line is the fact that it went through the heavy snows and the rigors of two High Sierra winters without a single interruption because of the line being down. There were a few outages from trees against the lines, but none because of mechanical failure.

Type of Construction

Class 1 and 2 poles, relatively short spans, ACSR conductor and heavy guying made this possible. The average span is only 300 ft. However, there were a number of long spans. One was 1,800 ft. All conductor, both primary and secondary, is No. 2, seven-strand aluminum ACSR. Heavy guying was employed. In addition to guide angles, corners, and dead-ends, all long spans were side-guyed. Guys above 500 ft. elevation were placed at an angle of 60° rather than the more desirable angle of 45°. Experience had shown that with heavy snow loading it is better to use the steeper pitch. Conductor is armor rodded throughout. Spans of 500 ft. and over were provided with conductor dampers. The accompanying staff photographs show features of construction and the heavy snow conditions that have to be contended with.



All primary taps are fused according to the load carried to protect the main line. Two Pacific Electric Mfg. type AP-40, pole-mounted service restorers were used. One of these is placed at the beginning of the line to protect the rest of the system against the new line; the other is located at an elevation of 6,800 ft. for protection against the extreme dangers above that elevation. Transformers were equipped with lightning arresters and secondary breakers.

Joint With Telephone

The line was built as a joint pole line with the Pacific Telephone and Telegraph Co. Original plans calling for cable were changed in favor of powerline 'phone service. For this purpose all primary taps are provided with radio-frequency chokes.

These are the interesting features of a rural line that had to be built to suit several interests beside the utilities. The Forest Service wanted to keep the right-of-way narrow with a minimum of tree-felling. Lessees of Forest Service lands for the summer cabins wanted to preserve the beauty of a natural recreational area. The State Highway Department wanted the line kept away from the highway and out of sight. And withal, the utility wanted a line that would stand up.

PREVENTIVE MAINTENANCE—IV

H. Burns Colby
Maintenance Engineer
Public Service Co. of Colorado

THE measurement of contact resistance has some value in a preventive maintenance program. There is available a very practical instrument for this testing which is made by the Biddle Co. It is called a "Ducter" which is a low-resistance ohmmeter. Its most important application is in testing air and oil circuit breaker electrical connections, including contacts. Pitted and corroded contacts, improper alignment, weak springs, loose connections, etc., are usually betrayed by relatively high contact resistance. Other important applications are: Measuring the resistance of transformer windings; measuring the resistance of motor and generator stators, rotors and series field coils; and measuring bar-to-bar resistances on commutators of motors, generators and rotary converters.

Ground Resistance

The importance of low-resistance grounds in the proper operation of protective equipment is generally recognized. There are several test instruments available for measuring ground resistance on the market. The "Megger" ground tester made by the Biddle Co. is a rugged but accurate instrument. It uses a-c fall-of-potential method. The effects of polarization, electrolysis and stray earth currents are avoided. There have been literally hundreds of technical papers written on the various aspects of grounding. A few of the recommended values will be given herein.

1. The ground lead should be as short and as direct as possible.
2. The resistance of the ground should be measured periodically and reduced to the limits given below, when found excessive.
3. Each foot of unnecessary length in protective apparatus ground leads loses about 2 kv. of protection.
4. Recommended ground resistance:
   (a) Large plants and substations, 1 ohm.
   (b) Medium size plants and substations, 5 ohms.
   (c) Unimportant plants and substations, 10 ohms.

OCB Mechanical Operation

The Cincinnati Clock & Instrument Co. has developed a circuit breaker operation analyser which consists essentially of two main elements: a vertical drum carrying a ruled chart, driven by a synchronous motor through suitable gear reductions; and a pencil slider operated through a reducing mechanism by the lift rod of the oil circuit breaker. The rotary motion of the drum gives time in cycles (60-cycle basis) as the abscissa on the chart, while the ordinate represents the travel of the circuit breaker contact mechanism in inches. There are two speeds available on the rotating drum giving three-eighths and three-quarters of an inch per cycle.

From these charts the following data may be obtained on the breaker operation:

1. Trip time until contacts part
2. Time to full open position.
3. Velocity of contacts through arcing zone.
4. Amount of rebound on opening.
5. Time till contacts start to close.
6. Closing time until contacts touch.
7. Time to full closed position.
8. Amount of overtravel on closing.

Insulating Oil

There are at least two tests that should be made on insulating oil. These are dielectric strength and acidity.

1. The dielectric strength of oil is the easiest test made and is the most common. New oil will have dielectric strength of approximately 30,000 volts. When in use it should not be allowed to go below 22,000 volts in transformers or 20,000 volts in oil circuit breakers. Regular testing schedules should be set up for testing oil. These should consider the importance of the equipment, and the voltage. Also, water-cooled equipment should be tested more frequently than air cooled. For example, a testing schedule for oil might be set up as follows:

Transformers
- 44 kv. and over, water cooled—test monthly.
- 44 kv. and over, air cooled—test quarterly.
- 22 kv. and under, watercooled—test quarterly.
- 22 kv. and under, self-cooled and house power—test annually.

Voltage Regulators—test every two years.

Oil Circuit Breakers
- Important high voltage—test every three months or after two trip outs on fault.
- Less important and low voltage—test annually or after five trip outs on fault.

2. The test for acidity is necessary to determine sludging conditions of the oil. Transformer oils tend to become acid in service. This is caused by the oxidation of a complex hydrocarbon. Organic and inorganic acids and new water are formed by oxidation of oil. These acids may attack insulating material and the metal parts of the transformer. Consequently, a low acid number is desirable.

The acid or neutralization number of an oil is the number of milligrams of potassium hydroxide required to neutralize the acid in one gram of oil under specified test conditions. Usually, it is made by heating a sample of the oil in contact with an alcohol-water solution to the boiling point and neutralizing the mixture, while hot, with a potassium hydroxide solution using the color change of phenolph-

Summary of Test Information

Test		ASTM No.	Typical Test Values New Oil	Aged Oil
General		D117		
Test methods		D923		
Sampling				
Primary Tests				
Dielectric strength	(volts)	D877	26,000	20,000
Acid No.		D663-D664	.03	.40-1.5
Sludge	(%)	D670	None	.2
Steam emulsion No.	(Sec.)	D157	25	200
Secondary Tests				
Power factor	(%)	D924	1	10
Interfacial tension	(Dynes per cm)		40	15
Resistivity	(ohms)	D257		
Color	(ASTM No.)	D155	1	6

thalein to determine the point of neutralization (color indicator titration ASTMD663). The electrometric method of titration may also be used and is described in ASTMD664.

There is considerable difference in opinion as to the magnitude of the neutralization number where sludging of oil takes place. A number of transformers have been inspected that had a neutralization number of .65. It was found that there was from one-half to one inch of sludge in these transformers. This sludge closes the cooling ducts, coats cooling tubes and radiators. This in turn increases temperature, and also causes damage to insulation. There are a number of other tests that can be made on insulating oil such as interfacial tension, steam emulsion, power factor, and so forth. However, it is believed that the dielectric and neutralization number tests show all that is necessary.

The ethanolphenolphthalein method consists of heating a 100 ml. mixture of 10% methanol, 90% ethanol, with equal part of distilled water to the "bumping" point. Then a 10-gram sample of oil is added and the solution titrated to faint pink end point. A standard solution of potassium hydroxide is used (1 ml. = .005 gram KOH).

$$\frac{\text{(ml. of KOH used)} \times 5}{\text{Weight of oil taken}} = \text{Mg KOH per gram of oil.}$$

or,

$$\frac{\text{(ml. of KOH used)} \times 5}{10} = \frac{\text{ml. KOH}}{2} = \text{N/N}$$

The following table is given by W. C. Sealey of the Allis-Chalmers Co.:

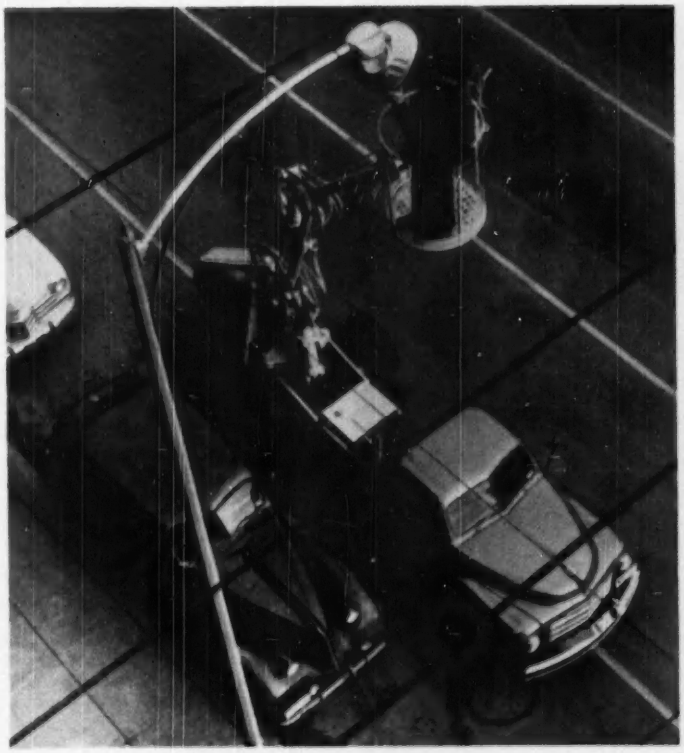
Transformer Ratio

The transformer turn ratio test set is an effective tool which can be used on maintenance as well as new installations of transformers. The James G. Biddle Co. has on the market a portable direct-reading "TTR" transformer turn ratio test set. This set saves considerable time and increases accuracy of tests analyzing transformer conditions and problems. Measurement with this set is independent of the regulation characteristics of the transformer under test.

The instrument operates on the principle that under no load the voltage ratio of a transformer is almost exactly equal to its turn ratio. This test set is essentially a reference transformer. It functions with the "back-to-back" connection, by which the reference transformer is excited in parallel with the transformer under test. The two transformers are connected in series on the high sides where the circulating current is brought to a null balance. The transformer conditions and problems that can be analyzed follow:

1. Measuring turn ratio of new, repaired and rewound transformers.
2. Identifying and checking correctness of leads and taps and their connections.
3. Determining or checking polarity and continuity.
4. Investigating load division between units or banks.
5. Investigating problems involving circulating currents within units or banks.
6. Identifying short-circuited or bypassed turns.
7. Routine or special tests to reveal internal faults and tap-changer defects in step regulators as well as transformers.

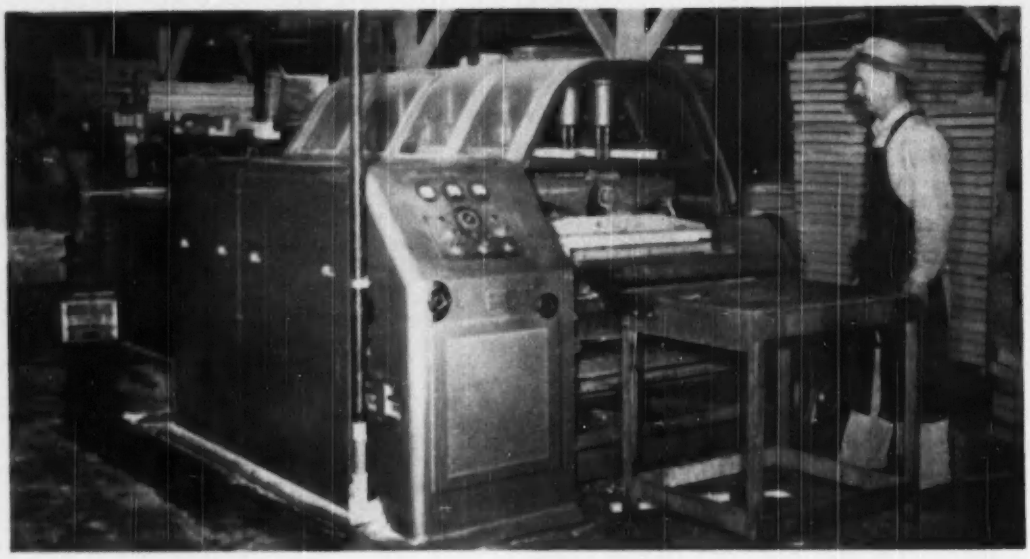
This concludes the series on preventive maintenance.



High With a Hi-Tender

THE ingenious lift truck shown, known as a "Hi-Tender," recently was placed in service by Seattle City Light for maintaining street lights and other overhead equipment. It has a truck-mounted, articulated boom carrying a self-leveling work basket. Hydraulic power supplied by the truck engine is controlled by finger-tip levers at the cage. The operator can raise himself up to 33 ft. in six seconds, on a swing of 180°, or to either side on a radius of 20 ft. In servicing street lights or overhead traffic signals, it can raise a 200-lb. load to position without manual effort or hazard.

Superintendent Hoffman believes the unit can do twice the work of other equipment with the same manpower. Cost was approximately $2,000. Stemm Bros. Inc., of Leavenworth, Wash., is manufacturer of the Hi-Tender. It is an outgrowth of principles used in developing an apple picking machine. City Light plans using the unit principally to install and maintain street lights. The city has a $4,000,000 street lighting program which includes mercury vapor lamps mounted 33 ft. high along arterials.



Dielectric Edge Gluing Effects Big Savings

L. B. Reed

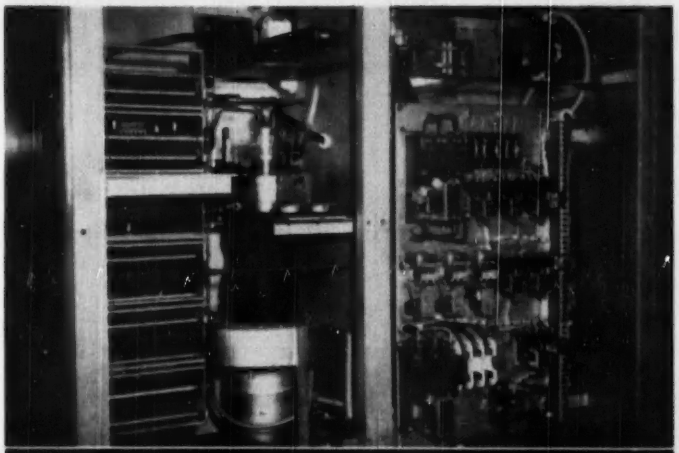
Industrial Heating Consultant
Los Angeles Department of Water & Power

FURNITURE manufacturing plants use thousands of feet of edge glued wood as core stock for veneers, and for solid pieces. Edge gluing is employed to eliminate warping, which would occur if wide pieces of wood were used. If a table top was made from one slab of wood, it would warp unless firmly held by pieces of heavy wood. But large surfaces which will not warp may be obtained by edge gluing pieces of wood that have been rip sawed to widths not exceeding four inches. Four inches is the maximum width, since it has been found that warping becomes noticeable in widths over that dimension. One to three inches are the most desirable. Therefore, edge gluing is employed to eliminate warp or weight, and is used in a large amount of furniture.

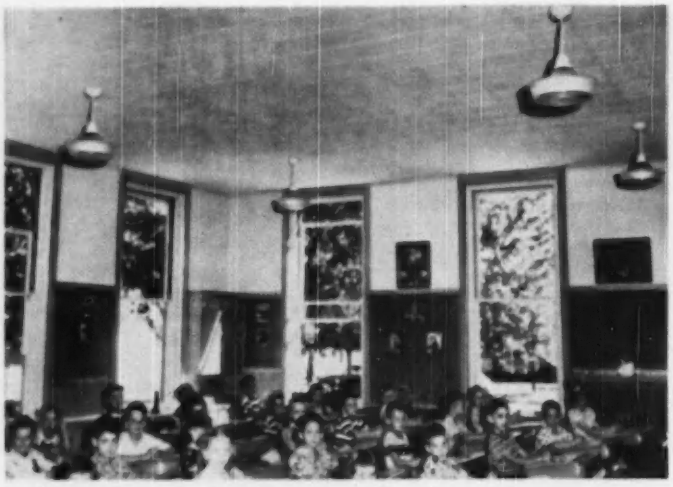
Two applications are used, one for core stock, and one for solid pieces. Core stock is used as the base for veneers, and does not need to be a neat job since it is covered with the veneer. But in making solid panels of selected hardwood that are not covered with veneer, such as would be used in making the top of a solid oak

table, it is necessary to do edge gluing in such a manner that it would necessitate a close examination to determine where it had been glued.

High-frequency dielectric heating has proved itself particularly valuable in this field of glue drying. Furniture plants have saved themselves many hours of labor, and hundreds of square feet of floor space. A typical plant is the Gillespie Furniture Co. in Los Angeles, where a savings of 210 man-hours a week has been made, and 200 sq. ft. of floor space has been made available for other purposes. This plant developed its own unit during the war, and found it so successful that it formed another company to build dielectric edge gluers. They have found that scrap can be utilized for lumber by use of this machine in making core stock, and that the hydraulic power available in the machine makes it possible to glue up solid panels that will pass critical inspection. The accompanying photographs clearly show the excellence of construction and ease of operation. These units are now in use all over the country; in Oregon, Washington, Virginia, North Carolina, South Carolina and New York.



High-frequency gluing unit. Opposite top is front view. Generator is rated at 15 kw. Period of drying is preset. Rear of machine with glue rolls is shown above. Photoelectric device to stop conveyor may be seen. Right upper view shows generator, control relays and switches. Lower right and opposite are views in Rialto, Cal., plant



Contractors

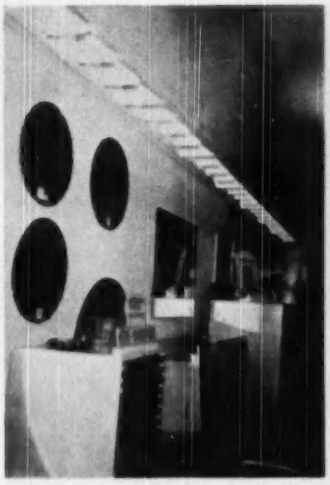
WHO says contractors cannot sell? Many do. Their example should prove that any contractor can—and improve his business and profit thereby.

In Walla Walla, Wash., Noland-Gage Electric Co. is such an example. Frank Gage, trained in selling lighting by years with Pacific Power & Light, joined Homer Noland, residential contractor whose shop was in his garage at the rear of his home on East Alder Street, shortly after the war. (Noland and Gage in their office, pictured above). Gage preferred to remain in Walla Walla to a transfer to Yakima for the utility, so bought a partnership in the firm.

By applying the selling principles he had advised contractors to use for years as a utility man, Gage has been the salesman, Noland the construction man, and teamed up they've done some excellent lighting jobs in their area. A few are illustrated here:

Local schools were badly in need of lighting. Budgets were inadequate. But the board was sold the idea of doing one test room at Sharpstein School. It was a 26x32-ft. room with northeast exposure. Six 300-watt Holophane Corectolite units were installed in a Celotex ceiling, manually controlled by two switches. The room was redecorated, equipped with posture desks. The sample has opened parents' eyes and made a demand for relighting of all schools.

In home wiring, besides selling an adequate wiring job, Noland-Gage has sold added features, such as flush-

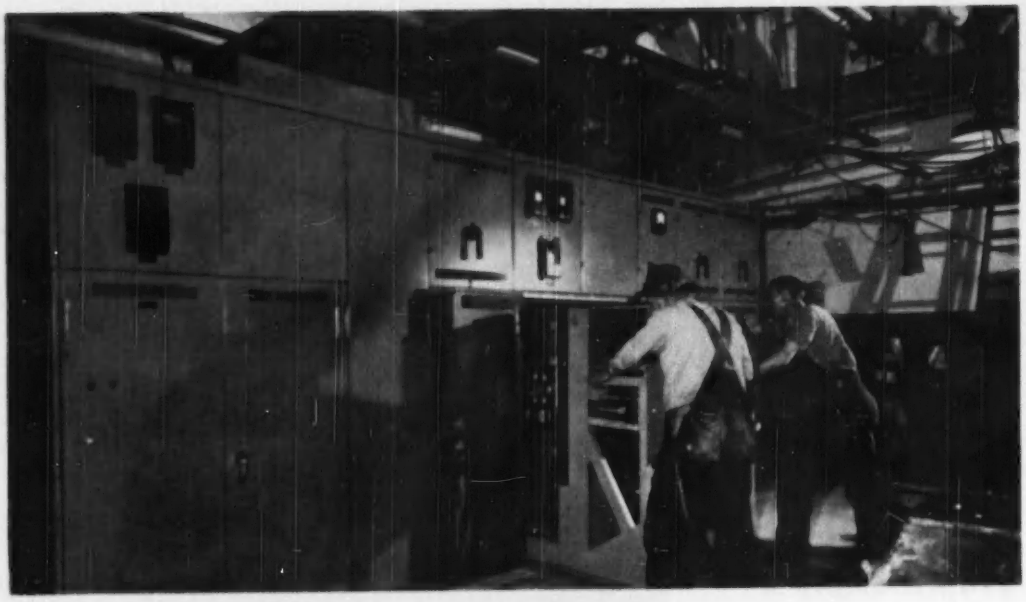


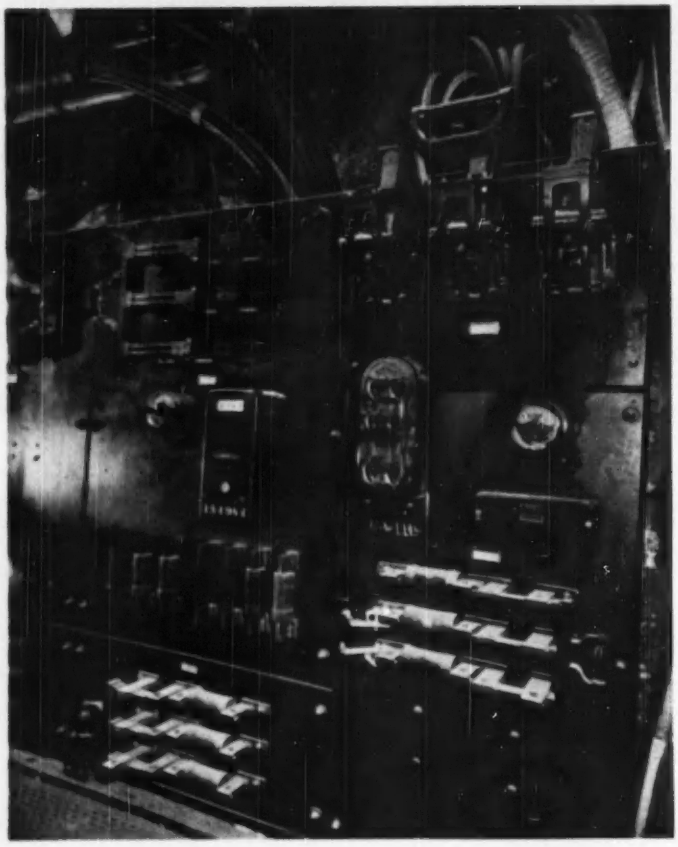
Who Sell

mounted ceiling units (like those in the Richie home, picture here, in which 12 such units were sold).

The gift and card shop on the bottom of the facing page wanted more attention on its card display. So it was sold a slimline concealed lamp along the inside of a valance that does the job. A similar idea was sold the Fuller paint store, shown above, along a wall used to display mirrors. Here a louvered troffer along the bottom of a dropped ceiling makes the display stand out, yet conceals the lamps. At night often this cove alone is left on, dramatizing the display and spilling enough to show other merchandise in the 25-ft.-wide store.

Teague Motor Co. showroom and shop, pictured along right, though done long ago, still ranks tops in the city. In the sales room and mezzanine office Hub fixtures using two 3-lamp fluorescent units in a line with a 300-watt spot in the center, covered by Holoflux and Controlens glass, provide flexible means for many lighting combinations. Window perimeter 300-watt spots can be directed at the cars because mounted on flexible stems. Gage engineered the service control system, pictured at center over the service manager's desk, as well as shop industrial and parts department lighting with fluorescent single-lamp strips. The control of shop work centers (as shown below) in a control room equipped with a panel to operate signal lights, a conveyor from below, intercommunicating telephones.





Department Store Rewires

FIRST step in a complete electrical modernization program has been taken by the White House department store in San Francisco. Included in the first stage, costing $78,000, were the new switchboard illustrated, new feeders and new panelboards. The switchboard is an ITE board with two 4,000-amp. breakers. From here there are four, 1,200-amp. three-phase four-wire Trumbull low-reactance feeder bus ducts supported with Unistrut hangers which run to two new load centers. From these load centers existing conduit was utilized wherever possible for new type T cable circuits to panelboard cans. Use of the type T wire made possible increasing the wattage per square foot from 3 to 8 watts. All new breaker-type panelboards were installed.

To feed the new board, Pacific Gas and Electric Co. installed a new network vault within the building. Capacity was provided in the new switchboard for future light and power needs of the store. These include relighting, new a-c elevators, escalators and ventilating, and air conditioning. The old switchboard, antiquated and overloaded, is shown in one of the accompanying views. Note the clamps on the lower right switch to prevent heating.

ELECTRICAL WEST Contractors' News Letter

In a word

It hasn't begun to really hit **conduit** and other **steel** supplies in the West yet, but the coal strike will be felt in a tight supply and probably higher prices before summer. Winter construction lull hasn't made much demand on stocks but spring building may bring a return to scarcity on many items.

Ought to be a law

Laws seldom cure. There's lots of yammer to get them passed as a cure for something. Then nothing done to use them. Take the **Robinson-Patman Act** that was to stop **price discrimination.** It is on the books but unused. Legislation seldom is the answer to trade evils. Education sometimes is.

1950 Code

Code making **Correlating Committee** of **NFPA** meets in Chicago in March to go over the changes suggested for the 1950 edition of the **National Electrical Code.** Time for receipt of changes for that edition closed in November. The various article panels have been chewing over the requests since and will turn their recommendations over to the **Correlating Committee** for editing.

And orders

Meanwhile formal hearings on changes to the **California State Safety Orders** were completed in February and after editing and correlation will go to the board for approval, then be printed. By midyear the new edition should go out.

B.C. license

Licensing of **electrical contractors** has been enacted by the British Columbia provincial government. Those who have been in business the past two years will be eligible for certificates without examination if they apply within 60 days. Area covered runs from the border to just north of Prince Rupert. **Charles Longley, Vancouver Electrical Assn.** member, has been recommended as the contractor member on the board of examiners.

Blame quiz

"Who's to blame for contractor inertia?" was kicked around at the **National Adequate Wiring Bureau** conference at St. Louis, Feb. 17, first by Contractor **Hugh Scott** of Corpus Christi, Texas, **NECA** business development committee chairman; then by **F. E. Davis,** chairman of EEI's wiring committee, and then by the whole conference. **Scott** maintained that industry practices which chisel into a contractor's ability to make a profit, keep him a small and inefficient business man, unable to finance sales effort. **Davis** recited many examples too true of too many contractors to show their negative attitude, responsible both for poor profit and poor wiring. **Lyle Foster,** a Peoria contractor, cited the value of **good will** to his business and of selling adequate wiring promotion as a source of good will and more profitable business.

Stability and finances

NECA, by the way, has just issued an impressive **directory** of its membership in the February **Qualified Contractor,** cross classified by firm name and by chapter membership. The roster itself is an indication of an association that is on a sounder financial footing than it used to be, before its members saw it was good business to put some money into it. The parallel holds in running a contracting business. It will be **good** when it is made **profitable.**

Names news

Names you may know—**George R. Sommers,** who just went back East after being director of Pacific Coast sales for **Sylvania,** has been promoted again, this time to **assistant general sales manager,** radio tube division, **Sylvania Electric Products Inc.** . . . **James Dixon,** electrical inspector and superintendent of utilities for **Santa Clara,** retired March 1, after 38 years with that job. His successor is **Edward J. Keogh,** UC graduate electrical engineer who has been with **PG and E** at **San Jose** and before that with **California-Oregon Power Co.** . . . **James Cannon,** founder of **Cannon Electrical Development Co.,** Los Angeles, died, Feb. 20.

Ups it

Salt Lake City's chief inspector, **D. J. Wolters,** announced some new rules recently, among which was that no smaller than No. 6 wire will do for services.

Number glows

Circlite Corp. of Chicago announces an **illuminated house number** for homes or commercial buildings, using a 6-watt black light lamp to energize numerals made of a special plastic that glows orange, can be seen 1,000 ft. away. Comes complete, lists at $9.95. Five numerals can be attached to it.

Larger place

A house warming for the new San Francisco home office and plant of **Fluorescent Fixtures of California** was held by **E. O. Anders,** its president, March 3. Plant, with 64,000 sq.ft., makes **All-Brite fixtures.** Former plant was at 24th and Folsom. New plant is at 3320—18th St. **Charlie Buchanan** is vp and sm.

No quitter

Any contractor who thinks he has troubles should feel ashamed when he learns what **J. D. Owens** of **Mountain View, Calif.,** has done. While cleaning insulators at the switchyard at Permanente, someone threw the switch and he got 66,000 volts. Lost his right arm and both legs from it, also had his sight impaired, but he had **spunk.** He now runs a contracting business, has developed a mechanical hand, skates and gets around. Deserves credit for guts.

Safety week

Electrical Safety Week is now a regular institution in **Washington state,** because of the active work of **Captain Stephen E. Sanislo,** of **Seattle** fire department. **Governor Langlie** has designated **April 23-29** for it. Colorful **Sanislo** urges that other states take it up. **Electric Club of Washington** sponsors it. How it can be organized is contained in a bulletin the club issued.

Fan sizes

National Association of Fan Manufacturers has published standards for vaneaxial and tubeaxial fans as a service to architects, engineers and public as to size standards etc. **NAFM** bulletin 105 replaces former form X-12.

Fuse sub.

Mini-breaker, made by **Mechanical Products Co.** of Jackson, Minn. screws into standard fuse sockets to replace fuses. They can be reset by a toggle switch. Such breakers so far, made by several manufacturers, are not UL listed.

Replace fixtures

Moe Lighting Inc., has started an advertising campaign in the **Post** and **House Beautiful** to sell the public the idea of replacement of old-time fixtures with new of better design and efficiency.

Helps

Westinghouse news of interest includes a new 32 page demonstration handbook for the **4-H electric program,** listing 100 suggestions for showing lighting, appliances, motor, wiring, tool and other electrical devices. . . . Has a 20-page booklet with the **A-B-C Plan for School Lighting** which covers the problems typical to most schools....Has put a **Productive Power** show on the road which will tour the country and reach the West late in the year.

Farm wiring

Farm Electrification Bureau, 155 East 44th St., New York, has released an illustrated and well arranged booklet, **"Planned Wiring—the key to better farming,"** which any contractor serving a rural area should be able to use to sell farmers a first-class electrical installation instead of attempting to do their own wiring. Covers typical barns, houses, farm home, shop, granery and milk house, advocates underground wiring. Same bureau has cost comparison data, advertising and promotion materials to sell **Go All-Electric.**

College too

University of Idaho farm electrification committee has just produced a 4-page leaflet, **Electric Light for the Farm** which is being circulated by all utilities in that state to farm customers. Previous one was on electric heat uses.

Heat pump water

Heat pump or **reverse cycle water heating** is not as dreamy as it sounds. **Utilities Research Commission** (several midwest utility companies) has been working four years on it and finds it has fine possibilities. Provides a convenient means of water heating at less than resistance heating costs, lower demand, and provides dehumidification of a home laundry room. It will be an installation job when it comes.

Keep plugging

Nothing takes the place of just plain **steady hard work** in promoting adequate wiring. **Electrical Service League of B. C.** just keeps plugging away and gets substantial results, its annual report by **Dick Hall** shows. Out of 4,230 building permits, 1,680 in the low-priced field, the league certified 1,046 for **Red Seals,** influenced most of the others to approach adequate standards. There's no magic formula for wiring promotion, just lots of calls and work. The **100-amp. service** has been made a requirement of the **Red Seal** job.

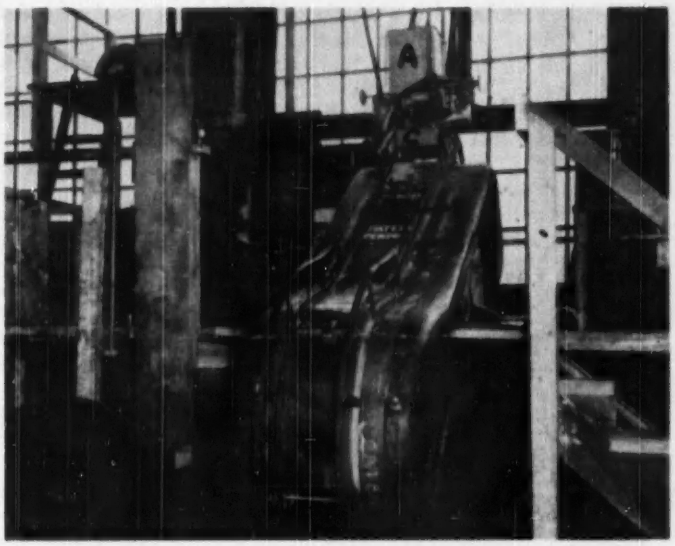
Multiple control

Remote control units, containing both lamp holder and relay for PAR-38 reflector-type lamps, for outdoor use, have been brought out by **Steber Mfg. Co.** Switches operate on 24 volts. Transformer is integral with the unit. Cast aluminum, in one, two or three lamp units, switching can be from several points.

NORTHWEST ELECTRIC LIGHT AND POWER ASSOCIATION

Utilization Data Sheet No. 64

SUBJECT: Automatic Boiler Welding Unit
CUSTOMER: Vancouver Iron Works Ltd., Vancouver, B. C.
TYPE OF BUSINESS: Boiler Manufacturers and General Engineering Works
SIZE OF BUSINESS: 500 Employees
SERVICE COMPANY: British Columbia Electric Co., Ltd.
DATA PREPARED BY: E. H. Tarrant, Industrial Sales Representative



During the war manufacturing of marine boilers was put on a mass production basis by Vancouver Iron Works Ltd. Plant Superintendent A. E. House designed many ingenious machines to mechanize the work. It was made as automatic as possible. So successful were these new methods and machines, that production time was reduced sufficiently to lower the selling price of boilers approximately 30%. This time saving enabled this one plant to produce 52% of all marine boilers manufactured in Canada during the war.

The outstanding single accomplishment was the invention of an automatic seam welder to traverse irregularly shaped objects. In automatic seam welding, it is imperative that the section of the seam being welded be kept horizontal. This was accomplished by mounting the object between two trunnions which rotate it automatically either in a forward or reverse direction. In this way the welder is always working on a horizontal surface. Adjoining parts to be welded are prepared in the standard manner and are spot-welded prior to the seam-welding operation.

A typical set-up is illustrated. Here a Scotch Marine boiler combustion chamber is being welded. The welding unit (A), set on wheels, rides temporarily attached tracks (B) which follow the contour of the seam. The rails set above the tracks on the curves serve to steady the welder. The welder is motor (C) driven along the seam at any desired speed by means of a gear engaged in a rack (D). The welding time on this combustion chamber was reduced from 130 man-hours with manual welding to two man-hours with automatic welding. Electrical energy consumption was not appreciably changed but in any event it forms a very small percentage of the cost of the combustion chamber.

This particular device developed under wartime pressure has since led to development of an entirely new and even more important device. It is used for peacetime work in the construction of Class A1 pressure vessels. All seams, both circumferential and longitudinal, that can be, are welded by standard boom-mounted welding units. However, when the pressure vessel is finally assembled, the one remaining circumferential weld is made with this automatic unit. The unit and the track are placed inside the vessel before the two halves are spot-welded together. The cylindrical vessels are rotated on rolls. The speed of these rolls and the welding unit are synchronized by the welder inside the vessel so that the unit will always be welding on a horizontal plane. This method of guiding the welding unit requires no manual guiding to make the electrode follow accurately in the center of the seam during the entire length of the weld. This is imperative. It once more eliminates the human element. All parts can be removed through a standard manhole.

Any thickness of plate can be welded from one-eighth inch. In this plant to date, maximum thickness has been three and one-half inches. Continuous runs up to one hour have been made. Welding rates are the same as those for standard seam welding. Standard welding rods are used.

These welding units make use of standard Union Melt automatic seam welders. The method of welding could make use of units of any size manufactured. At this plant 1,000-amp. and 1,500-amp. welding units, and two 1,000-amp. units in parallel for 2,000-amp. welding are used. Primary voltage is 440 volts single phase, 60 cycle. Secondary voltage is 100 volts on open circuit and 35 to 38 volts under load.

Time saving is shown by a typical example. Welding circumferential seam on a 72-in. diameter pressure vessel of one-half inch plate requires four hours for manual welding. Only one hour is required for the automatic welding. This hour includes the time required for setting up and removing the unit.

The superiority of welded boilers over riveted has long been recognized. Since Class A1 pressure vessels must be welded internally as well as externally, this new device makes possible an automatic system, which is superior to manual welding.

ELECTRICAL WEST

No Legal Blackmail

HAD the suit brought by a dealer in Salt Lake City against a group of distributors and dealers and the association succeeded and a verdict requiring payment of a million dollars in "damages" been rendered, a new form of legal blackmail would have been born. Thereafter any dealer going broke from natural causes, such as inefficiency, inexperience, bad management or selling tactics that erased profits and wrote up losses, could have hired himself a slick lawyer, gone to court and accused all his suppliers and his competitors of conspiring in restraint of trade to put him out of business. Violations of franchise contracts would have meant nothing. Fair Trade protection of a manufacturer's trademark and brand and his relations with his dealers would have gone out the window.

Happily, the court saw through this device to get profit by suit that could not be gained by legitimate business means. Even with the judge directing a no-cause-for-action verdict, the emotional appeals over the plight of the "poor little guy" kept the jury arguing for several hours.

This case had far more deep-reaching significance than appeared. It is well that reason ruled and not false economy. Even so the case cost everybody involved plenty.

Wiring and Architecture

FOR a long time in America architecture was frozen to the forms of the past. It was as if Americans, unsure of themselves, felt safe to copy and adapt forms and shapes that had proved acceptable in Europe and Asia in earlier years. Even the so-called modern architecture, which really should have started in functional America, was launched in Europe.

In equipping buildings with wiring something of the same slavery to old forms has been experienced. Those engaged in wiring supply or installation seem to proceed as though there was something sacred about conduit and wire.

A clear thinking architect, Walter R. Hagedohm, gave the Los Angeles Electric Club some upsetting thoughts to ponder over both as to architecture and wiring. Simplicity and service to the function for which a building or house is built is the aim of modern architecture. But it finds itself still chained to cluttered, complex and space-wasting wiring and plumbing systems. This obstacle is further complicated by differences in local codes. He urged that the electrical industry take a more creative, less habit-bound attitude. Out of it might come much beneficial change.

Things Look Better

PRIVATE power is not a thing of the past in the Pacific Northwest. Had Guy Myers and his gang had their way in the purchase of the Pacific Power & Light Company common stock, no such conclusion would have been possible. Today, however, there is every assurance that both PP&L common stock and that of Washington Water Power may finally end up in the hands of the public of that region, with the present highly successful managements of these two utilities continuing to direct operations.

There is much to be condemned and little to be applauded in this phase of the breakup of American Power & Light under the SEC "death sentence." No satisfactory answer can be given for excluding Pacific and Water Power from the common stock distribution of other AP&L holdings. Nor can the initial secret deal with Myers, which would have led to the ultimate breakup of PP&L, be condoned.

Everyone who has the interest of private power at heart will applaud the heroic efforts of the operating management of the two Northwest companies to keep them intact. For their reward they have the personal satisfaction of winning another round in the long fight to preserve private power, plus the admiration and respect of their many friends for a job well done. They and the public served by PP&L must have relished this statement from the new owners:

"First of all the company will continue under the present management to render the best possible service to its customers at the lowest possible cost. This is and will continue to be the primary purpose of the company. All other considerations are secondary. We have

EDITORIAL VIEWS

purchased the common stock of this company because we believe in its future—we are fully convinced of the future of the Pacific Northwest after many years of study of this region.

"We have, at the present moment, no plans for the disposition of this stock. As American, bankers, we believe in the future of private enterprise . . ."

And how do you feel this morning, Messrs. Myers and Aller?

The Piper Must Be Paid

ONE of the penalties for dismemberment of an integrated electric utility company into bits and pieces is being paid by the people of Clark County, Wash. There is a striking lesson in their experience for other folks who would listen to the blandishments of extremists who say that public ownership of everything is the source of all blessings.

These blessings-in-reverse have come to the people of Clark County: A possible 10% increase in electric rates. An additional $500,000 of debt. The inconvenience of long power outage for many users of electricity. How did this all happen? Well, one of the worst silver thaws in the history of Northwest weather flattened the distribution lines of the Clark County PUD in January. Superhuman efforts on the part of employees plus all of the skilled workers that could be hired, together with huge sums of money, finally got the system operating. By the time all of the necessary repairs have been completed, some $500,000 of extraordinary expense will have been incurred. PUD coffers had no such reserves. The money had to be borrowed. Present rates would not insure repayment of the loan. So a 10% increase in rates appears necessary.

Conceivably had the Clark County electric facilities still been a part of the system of the Northwestern Electric Company, which for many years served the district, neither the burden of the loan nor the rate increase would have been necessary. Sufficient financial reserves would have been available. Under the modern application of utility regulation, customers in all parts of the larger area served by the company would have helped to carry the burden.

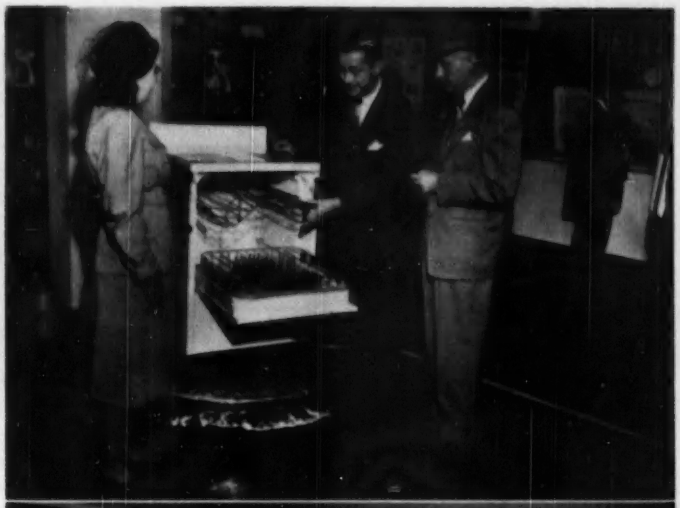
You Can Say That Again

ALL people of the earth can flourish together under the benefits of atomic energy, or they can live under the constant threat of appalling death, as more secrets of the atom are acquired, and by others besides ourselves and our allies. Fortunately, the community of interest that all people share in survival transcends ideologies, political theories and economic and social dogma. Those who guide the destinies of mankind must seek out and cultivate the interests that grow up about that first law of nature. Thus they may be able to build a practical regime of international cooperation around the atom bomb, and other select and specific problems, even though there continue to be, as I believe there will, strong national loyalties, as well as a diversity of economic and political ideas among the nations. The difficulty is great, of course, but not insuperable. For the need is pressing, and survival is at stake. After all, the greatest human power in the world today is not the atomic bomb. The human mind that conceived the bomb is a greater power by far . . . If at the same time that men succeed in splitting the atom, they split the intellect away from conscience, all the achievements of science, all modern contributions to the world's welfare and man's comfort, all the wonders of engineering, all the advances of medicine, will become but a handful of dust. Higher education in America must, therefore, adhere to its human tradition, seek the truth without fear or favor, and at the same time aid men and women to develop the enlightened intellect, broad human sympathies, and responsible character that alone can make a people both great and beneficient. It is enlightenment of both the mind and spirit, not the force of arms nor the dictates of legislation that makes men free.
—Dr. Robert Gordon Sproul, President, University of California.

Optimism, Sales High at S. F. Market

WITH inventories down, some 10,000 dealers and buyers flocked to Western Merchandise Mart, San Francisco, Feb. 6-10, to order for spring and summer trade. Orders placed were substantial, spirits optimistic. In appliances there were new models but only a few makes. Refinements, mostly, new styling.

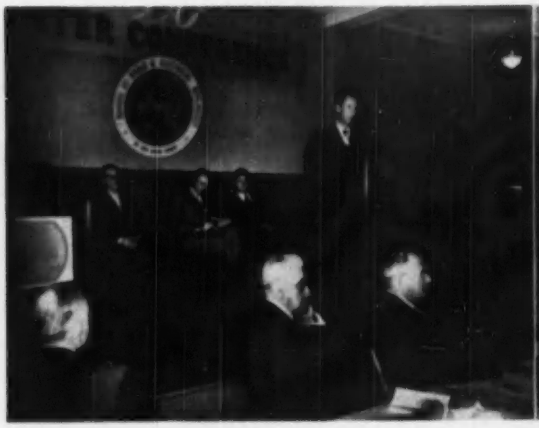
About 500 dealers filled in the chinks between TV cameras, platforms, lights in Mart Auditorium Wednesday night to witness what a lot of stuff it takes to put on a television show. The Dude Martin "Hoffman Hayride" was telecast right from the dinner. Afterward Ray Turnbull, G-E commercial vice-president, former Hotpoint head man, introduced Gasman W. Paul Jones, Servel president, who paid a glowing tribute to electricity and ended by claiming gas has got it too now. Before him Jack Otter, Philco general sales manager, discouraged dealers asking longer discounts on TV sets, urging they do like manufacturers (who recently cut prices), aim for more volume. He also answered many of the current gossip questions such as tube size (trend is toward the large sizes), square tubes (cost more, use more watts but fit cabinets better), color (it will be two and a half years yet even if FCC approves current tests). With figures he showed Western progress with TV sales lags the East. He urged more aggressiveness, more bragging over programs, meter and trial plans, more selling.



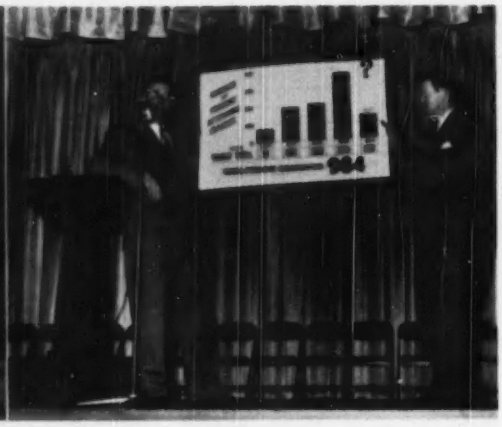
Pictured on these two pages: Hoffman "Hayride," Dude Martin television show was performed and telecast from the big appliance dinner (top of facing page), which was addressed by J. M. Otter of Philco (at mike, center, facing page) and W. Paul Jones of Servel (seated at left). Ray Turnbull, G-E vice-president, was dinner chairman (center). Below on bottom of facing page is a new contender in the low-priced ironer field by Hotpoint as shown to S. E. Losher, of "Losher's," Modesto (left), by V. E. "Buzz" Koch (seated), San Francisco district manager, E. J. Sorensen, key account division, Hotpoint, Chicago, and Howard J. Scaife, Western regional manager, Hotpoint, in San Francisco Merchandise Mart

Top to bottom on this page are: Casing the Western Holly television-equipped gas range to see if it might be classed as an electrical device were Western editors of Electrical Merchandising, Howard Emerson and Mrs. Clotilde G. Taylor. Verdict in doubt Maker of restaurant equipment, Hobart Co. introduced a Kitchen Aid dishwasher, through distributor Thompson-Diggs Co. Mrs. Ruth Canier of Distinctive Interiors, Oakland, and Ray Chism, Tahoe Furniture Co., Lake Tahoe, are being shown its features by Wayne Davis, Thompson-Diggs Co.

With drawer-like dishwasher, Westinghouse returns to the field. Christine Dent, Wesco home economist, tells E. A. Nickelsen, commercial manager, California Pacific Utilities Co., about it The new module Universal "Select-a-range" drew admiration from Mrs. W. W. Sharp of Saratoga and Mrs. Emma Knowles, San Jose. Floyd E. Bartley, district manager, ranges and laundry sales, Landers, Frary & Clark



"As dealers see it" panel, with Jim Harrington, Clint Mathews, C. W. Shanks and Ted Williams. Importance of salesmen was told by A. E. Holloway, seated, center



Dan Turner, director of sales training, and R. T. Redfield, chairman of sales training program, show impressive record of class attendance and completion by year

Refuel for Spring Selling Takeoff

San Diego bureau prepares salesmen for opportunities in TV and all appliances

TO THE tune of "Making More Money in 1950," more than 500 appliance dealers from San Diego County, plus over a hundred distributors and manufacturers representatives, convened in San Diego on Jan. 27 for the semi-annual Sales Conference of the Bureau of Radio & Electrical Appliances. For the first time having unlimited space for assembly, by utilizing the new convention center in Balboa Park, the bureau was able to accommodate all comers comfortably during the three sessions that began at noon and ended at 10:30 p. m., following five major addresses and the participation of more than 60 members of the industry in the program.

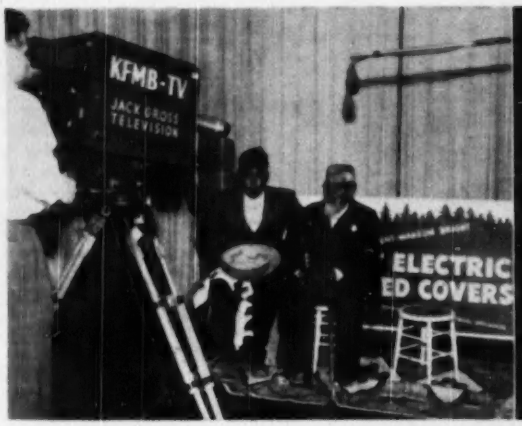
Following a welcome from James Robbins, chairman of the board of supervisors, Bureau President J. F. Zweiner introduced the dealer panel consisting of Jimmie Harrington, Clint Mathews, C. W. Shanks and Ted Williams. In their discussion of what 1950 presented, these dealers introduced ideas on the need for getting better service from distributors, particularly in the outlying areas of San Diego County, plus the need at dealer level for better instruction of the customer on using new appliances. Problems introduced by the dealers included how long to leave television out on trial, how to move merchandise that has become obsolete, and the need for more "service to stations" to handle repairs and maintenance of small appliances. The future for the dealer included, according to these representatives, the need to do better buying, stronger promotion and advertising, better point of sale displays, and better product training of the retail salesman.

TV Picture

Burt Cochran, advertising representative for the American Gas Assn., outlined the CP gas range program. He was followed by A. E. Holloway, president of San Diego Gas & Electric Co., who presented an outstanding address on "Salesmen, the Backbone of Free Enterprise." Stating that creative salesmen were the most important link between manufacturers and the consumer, "Doc" Holloway admonished salesmen to "have confidence in their ability, to know the value of their product, to study the prospects' needs, to tell the truth convincingly, and to ask the prospect to buy." He said that specialty selling presented today the greatest opportunity for young men.

The surface hasn't been scratched in television, said J. K. West, vice-president and director of public relations for RCA, Camden, N. J., in his featured talk at the noon luncheon meeting. In giving the San Diego dealers a close-up picture of the national television situation, West said that today the 16-inch TV set is coming into the reach of the mass market, that the new rectangular tube will help styling and reduce costs. His biggest emphasis was on the need for adequate service. He said that anything less than excellent service will hold back the opportunities in television for all—pointing out that good service makes salesmen of all television set owners. He added that attention should be given to the appearance of television servicemen, because they had access to the customer's living room. They should be neat, clean and courteous, he said.

The afternoon session of the sales conference opened with a showing of moving pictures of the 12th Annual Electrical and Home Show which was held in November by the bureau. Following that, Paul A. DuPont and Frosty Raymond outlined the advertising and promotional plans of the bureau for 1950. The featured "distributors' panel" brought to the stage Sam L. Hall, president of Electrical Supplies



Inspiration of bureau's electric bedding campaign, Joaquin Paipa, 118-year-old Indian, before KFMB-TV camera for program picked up and shown at big sales conference

Distributor panel included Sam L. Hall, Electric Supplies Distributing, San Diego; Lou Swenson, Ray Thomas Co., Los Angeles; and Sam W. Scott, Graybar, Los Angeles

Dist. Co., San Diego, Sam W. Scott, district sales manager, Graybar Electric Co., Los Angeles, and Lou Swenson, manager of Ray Thomas Co., Los Angeles. Presenting the situations faced by appliance distributors these men outlined the problem in getting dealers to use the point of sale material supplied by distributors and manufacturers and the difficulty in getting dealers and dealers' salesmen to attend product training meetings. Dealers were advised by this group to keep their lines diversified—that a dealer should handle as many products as the size and experience of the sales staff can handle with proper attention to each product. Such diversification will prevent the dealer from getting into trouble when he loses a line or when a line wanes in popularity.

Training Salesmen

R. T. Redfield, chairman of the bureau's sales training programs, and Dan Turner, director of sales training, outlined the results of the bureau's sales training efforts—showing that since 1946, more than 980 men have received sales training. The types of courses available were outlined to the dealers and salesmen present. The afternoon session concluded with another "manufacturers' product session" at which every visiting representative of a manufacturing concern was invited to present three minutes worth of news about his company, its products and its plans for the year. More than 25 representatives responded with latest news of their lines. (See last month's News Letter.)

Following dinner at the Balboa Club, with an attendance of more than 500, the evening session opened with traditional greeting from the Hon. Harley E. Knox, mayor of San Diego. Then the dealers' salemen took the spotlight, with Pat Graham, Kirk Hudson, John Lovrane and Harold Lottbridge analysing sales policies, which they had found valuable in their experience in postwar selling.

Dealers, salesmen and utility men received a strong and startling close-up of the attitude of the government toward control of consumer credit in a featured talk by W. F. Volberg, vice-president of the Federal Reserve Bank of San Francisco. While dealers considered Volberg's statement that there is a problem with merchants who prefer to reduce credit terms instead of increasing sales ability, many were left to ponder the implications of the idea that "control of installment credit (by the Federal Reserve Bank) is one means of controlling the ups and downs of business which it would otherwise accentuate."

Drama in Dryers

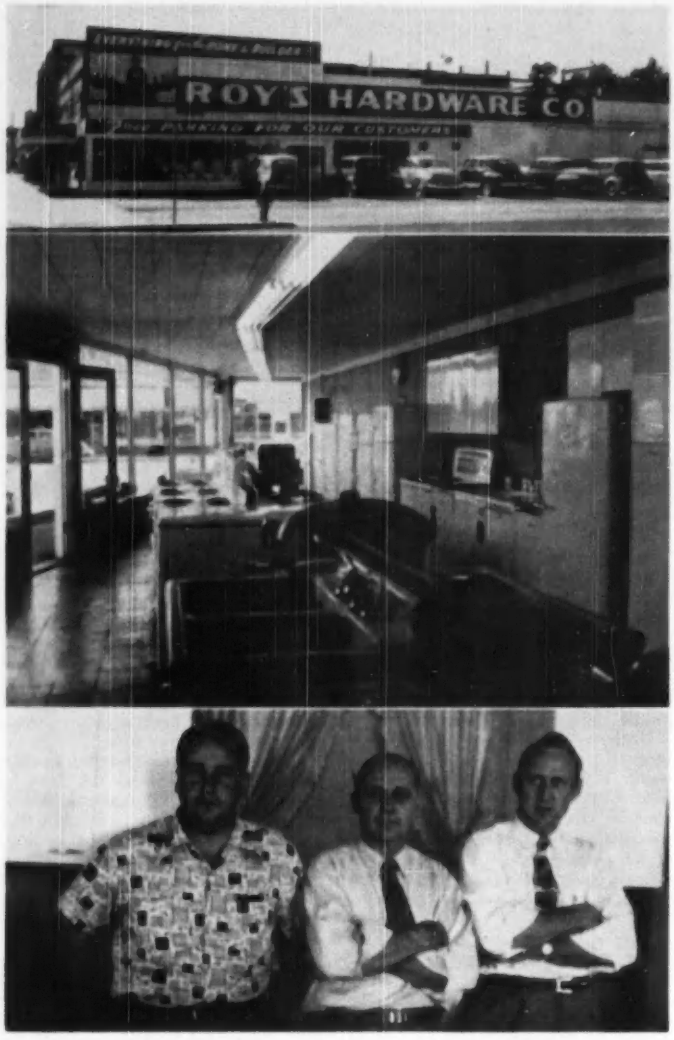
In keeping with its reputation for drawing outstanding speakers from anywhere in the nation, the bureau presented at the evening session an address by C. H. Rippe Jr., director of appliance sales, Hamilton Mfg. Co., Two Rivers, Wis., on "The Clothes Dryer and its Fast Developing Market." Prefacing his presentation of the opportunities for dealers in the sale of automatic clothes dryers with a Shakespearean dramatization of the unfortunate "clothes-pin drudge," Rippe pointed out that dryer sales have no other competition, no replacement problem, no service problem, and that 99 out of 100 housewives are prospects. Free trial in the store, and in the home, will be necessary to carry the idea to all prospects, he said. The woman who buys a dryer will be a friend of the dealer for life, Rippe said, and will sell dryers throughout her neighborhood and among her acquaintances. Dryers are "the biggest profit opportunity for the dealer today."

During the evening session, the audience was introduced to Joaquin Paipa, self-stated 118-year-old Indian, who has been the inspiration of the bureau's 1950 Electric Bedding campaign. Mr. Paipa, accompanied by Dean Howell and Indian Adviser Purl Willis, attended the dinner and then left to appear on a special television program over KFMB-TV. The program was brought to the Sales Conference through a number of TV receivers installed in the auditorium by manufacturers and distributors.

The first Sales Conference of the bureau ended on an optimistic note with statements from Howard Scaife, manager, Pacific District, Hotpoint Inc., Harold Thorell, national sales manager, Tradewind Motor Fans Inc., Robert Bell, vice-president, Packard-Bell, and E. B. Barnes, Pacific regional manager, Kelvinator, who discussed "The Appliance Business in 1950."

The Sales Conference was managed by bureau secretary-manager, J. Clark Chamberlain, and a program committee consisting of Audrey Thompson, Edward Babbitt, Robert Balch, Charles Beall, E. B. Hazie, Charles Kerridge, F. M. Raymond, and T. E. Wyatt.

Next event in the bureau's schedule is a Home Freezer and Frozen Food Products Show, April 27-30, in Balboa Park to stimulate sales this summer.



Drive-in Idea Brings Customers to Roy's

Parking troubles keep many customers from downtown stores everywhere. That is why the drive-in idea is applied to all kinds of businesses. In Yakima Roy's Hardware Co. uses it in an effective way that boosts its appliance sales considerably. When Bud Garfield joined the company to handle its appliance department he brought with him sales experience as a former Pacific Power & Light man from Walla Walla. Instead of using a corner of the hardware store for appliances, an old beer parlor next door was taken over, one whole side removed and replaced by big plate glass windows, the lot beside it paved for a parking lot. It also keeps the view clear into the appliance store from the main street in front or side street beside it. Lights are kept burning all night to make it a 24-hour sales booster. Inside along the wall is a working Hotpoint kitchen and laundry for ready demonstration. An electric water heater provides instant hot water. As a result Bud Garfield, Lawrence Winkenwerder and Carl Larson, pictured above, say they sell a dishwasher to 30% of the new homes in the $10,000 and over class in the area. Their factory trained repair man is Red Mullins.

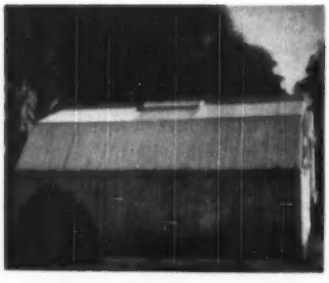
Policy Defined—

SOMETIMES when you define a policy in black and white it helps. Less excuse then for forgetting it, ignoring it or breaking it on the grounds of ignorance. That is why codes of ethics or policy are drawn. They remind all that there are rules of fair play. Until the antitrust laws are revised, that is all that you can do about trade practices. But it helps. And it helps to repeat the rules often. Even if there's nothing new in them, it helps to be reminded.

The time has come for some strong reminding. Competition is getting rough. Business is harder to get. Too much temptation to try some tricks to get an advantage. But when one tries a trick the others retaliate. Soon it's "no holds barred" and the business is hurt for all. As in war, nobody wins.

To define what is fair play between dealers and distributors, both ways, the Inland Empire Electrical Dealers Assn. has put it in black and white. Page 91 has a suggested code for dealers in relations with suppliers in one column; one suggested for distributors in their relations with dealers in another. It is worth being remembered and lived up to by both. It is a voluntary thing. Decency is the only policeman of either code. Fair play comes from good sportsmanship, not government regulation. Like business itself, it is individual enterprise.

● WHAT TO DO with old fluorescent tubes is almost as bad a problem as razor blades, but J. Robert Shine, auditor at California Electric Power Co., raises orchids and has built a superior greenhouse, pictured below, out of them. The frame is of redwood. Galvanized nails hold the tubes. With a putty gun the roof was calked watertight. Tests show that light transmission is better than whitewashed glass, and glareless. Took him and a helper ten weekends to make it at a total cost of $250 for materials. House is 13x18 ft.



What Is Fair Play In Distribution?

This is what every—

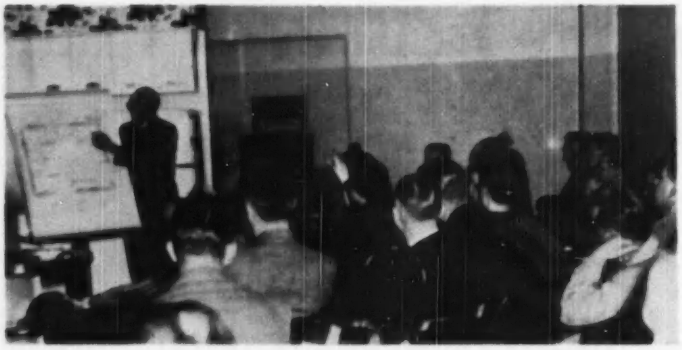
distributor should do—

1. Adhere in good faith to all terms of franchises and exact strict adherence by every dealer, thus giving franchises deserved value to all possessors.
2. Refrain from forcing or encouraging any dealer to maintain excessive or unbalanced stocks. Provide dealers with realistic and honest market guidance.
3. Encourage and assist aggressive merchandising by dealers, and limit franchises to those dealers who are able and willing to promote and sell a satisfactory volume, who display merchandise in a suitable business establishment, and who provide adequate service, but refrain from using coercion or threat to enforce arbitrary sales quotas.
4. Recognize that the dealer is entitled to stock more than one line of merchandise and owes equal loyalty and sales effort to another brand he is franchised to sell.
5. Sell only to franchised dealers, referring all other potential purchasers to retailers.
6. Sell to all franchised dealers on an equitable basis, providing only such price differentials as are justified by differences in quantity of purchases and providing uniform privileges and service.
7. Provide practical and economical assistance in merchandising, sales training, service training and promotion.
8. Maintain adequate stocks of repair parts to fulfill all probable needs and provide rapid and efficient distribution of parts.
9. Give adequate notice of intent to cancel franchises except when cancellation is provided by conspicuous violations of franchise terms. Provide adequate notice of price and model changes.
10. Provide efficient distribution that controls dealers' merchandise handling costs, but have a system sufficiently flexible to handle bona fide emergency requests and adjustments fairly and efficiently.
11. Establish reasonable credit policies that protect the distributor without harassing or unduly restraining the retailer in the profitable employment of his capital. Forego sales to poor credit risks rather than impose undue restraints upon all dealers.
12. State distribution policies frankly and clearly to all dealers and invite constructive efforts to settle grievances and achieve mutual satisfaction.

dealer should do—

1. Adhere in good faith to all terms of franchises.
2. Maintain a sufficient stock of merchandise of each brand to display the line adequately and to fill customers' orders.
3. Aggressively promote and sell brands for which franchises are held.
4. Limit franchised lines to a number that will assure volume enough in each line to justify a franchise.
5. Develop all feasible sales opportunities to produce a sales volume sufficient to justify supplier support.
6. Refrain from using superior buying power or coercion to exact unfair concessions.
7. Make fullest possible use of practical merchandising assistance, sales training, service training, and other aids made available by suppliers.
8. Provide efficient and complete service on all merchandise sold.
9. Give adequate notice of intent to close out a line of merchandise and dispose of close-out stocks in a manner which will not injure the brand name.
10. Make efficient distribution possible by avoiding frequent special and rush orders, returns without permission, and cancellations.
11. Conscientiously abide by the supplier credit policies mutually agreed upon at the time of franchising, and avoid the necessity of expensive and embarrassing special collection effort.
12. Discuss grievances involving a supplier with a member of the distributing company in a position of authority before formulating decisions regarding future cooperation. Recognize that rumored or actual unfair supplier practices may result from the unauthorized actions of a distributor's employee, and give those in authority a friendly opportunity to explain actual conditions and policies.

(See Page 90 for details of this Inland Empire Electrical Dealers Assn. suggested code.)



First Geneva Modern Kitchens training school in the Northwest was held at Prudential Distributors, Spokane, not long ago by F. E. O'Connor, Geneva general sales manager and vice-president. It was attended by 50 dealers from Inland Empire area. First day was a general sales meeting on kitchen potentials, product and sales plans. Second day was specialized to training for actual kitchen layout and estimating with Geneva's 220 items which permit great flexibility of arrangement in remodeling old or building new kitchens. Similar schools were planned for other distribution areas

Product Showings Shower Over the West

MOST every manufacturer with a product to sell has been holding product shows and sales stimulating meetings throughout the West in the past month or two. Some, like Crosley and International Harvester and Hotpoint, sprang theirs last year. Frigidaire has just completed a tour with its biggest show of all time. Despite blizzards and subzero weather in Portland, Seattle and Spokane, dealers packed the house for it. Some even came by caboose when the roads were blocked. That's loyalty. It also bespeaks the quality of the Frigidaire show.

General Electric and Westinghouse held a number of smaller meetings in various trade centers. Admiral had some big shows, so did Philco. Others may have also. In other cases meetings of Western distributors for a line met to hear the story from factory men. Then they met with dealers to relay it to them and their salesmen. Among the latter were those reviewed here:

Apex-Rotarex Line

In its first regional meeting in postwar times Apex-Rotarex officials met with the Western distributors of its products in San Francisco, Feb. 3. Into an energetic one-day session the full line with new models of washers, dishwashers, dryers, ironers and vacuum cleaners was expounded and demonstrated. To the line was introduced a garbage disposal. It was given the name, Wastematic, to go with Dishmatic, Washmatic and Foldmatic ironer. The new dryer is also a "matic," Drymatic.

Host was Lou D. Stull, Western divisional manager, whose headquarters are at Western Merchandise Mart. Factory personnel who put on the meeting included Frank Ryan, manager advertising and sales promotion, Henry K. Straw, product sales manager, and Herb Cooper, vice-president, Meldrum Fewsmith Co., advertising agency.

Distributors from the eleven Western states in attendance by representatives were: Tru's Distributing Co., Spokane; Commercial Alliance Co., Seattle; Glenn Earl Inc., Salt Lake City and Boise; Midland Specialty Co., Phoenix, Albuquerque and El Paso; John Dermody Inc., Reno; J. N. Cezan Co., Los Angeles and San Diego. Apex's own direct operation in northern California, with six district sales managers, was also represented.

"Step up to Apex" is the slogan to which the advertising promotion is geared, and Life magazine is to be used as a tie-in promotion.

Stull announced some new appointments to his Western staff. C. R. Van Derhyden becomes distributor sales manager. S. A. Ceruti, who until two years ago was office manager in Cleveland, becomes assistant division manager. Later Don Lennard was made the San Francisco district manager.

Deepfreeze Expansion

Both new executives and new additions to the line were introduced to Western distributors of Deepfreeze division of Motor Products Corp. at a San Francisco annual regional sales conference, Feb. 20. Ben Sanderson, now general sales manager, well known to the West because of his former position as Western regional sales manager, introduced his new chiefs, L. J. Sorensen, vice-president and general manager of the renamed Deepfreeze Appliance Division; and Leo Jaques, executive vice-president, Motor Products Corp., parent concern, who will be active in Deepfreeze appliances.

To give the pitch for the new line, which includes a new 16-cu. ft. freezer and the newly announced Deepfreeze electric range and water heater and a refrigerator, came factory experts. These were L. O. Braun, home freezer manager; P. R. Lowcher, manager of refrigerator sales; Frank Sacha, former Hotpoint man, manager range and water heater sales; and Rea Shields, top notch home economist for the factory. Sylvester Seibert, service manager, held clinics for distributor service men too.

Western distributors attending in force included: Ray Thomas Co., Los Angeles; Frank Edwards Co., San Francisco; Stubbs Electric Co., Portland; Wallace Campbell, Northwest Appliance Distributors, Seattle; Tubbs Electric Co., Spokane; Keefe Auto Supply Co., Billings; and June Jackson, Salt Lake City, Utah.

The full line includes six freezers—two each of 7.2 cu. ft. and 12.3 cu. ft.; five refrigerator models from a 7 to 11; four ranges from apartment to deluxe, seven water heaters in both tank and cabinet height models ranging from 31 to 66 gal.

As before Deepfreeze has a bigger variety of sales helps and promotion materials than most anyone in the field and a big advertising budget. To popularize the already well-known name for freezers as a name for the range, water heater and refrigerator, spectacular two-page cross page ads will be featured.

R. F. Harnish, Western regional sales manager, followed the distributors showing with help in holding dealer meetings with each distributor in the region.

Going into a full line has given some of the Western distributors a problem with their competing lines.

ELECTRICAL WEST

Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

March 1050

Guesses

Bad weather slowed down sales in the Northwest but with signs of spring the outlook is brighter. As this goes to press it looks like the coal strike may end, which should make for more optimism and restore production. Steel shortages may be reflected in appliance volume this summer. Labor outlook is clouding for some stores some contract renewal dates. No immediate signs of any more price cuts, even in TV.

Tighten franchises

There is a strong trend toward tightening up the overextended distribution setup, however. Thor made headlines when John Hurley announced they would reduce number of franchises from 20,000 to 7,000 and expect more from them. After careful survey of market areas, dealers, potentials, Barney Clawuson, Thor San Francisco area manager, promises dealers market protection, price stability, factory assistance in return for identification, strong selling effort and effective display and demonstration. Thor now has a dryer too.

Check on prospects

A prospect work card by which to follow up on prospects supplied to dealers is announced by So. Calif. Edison Co. Last year, Henry Rice says, 25 adequate wiring advisors, 5 field counselors of the company turned over 10,000 prospects, 6,000 interested in ranges, to dealers. The work card enables dealers to report progress both for his own efforts and the utility. Another new idea being started at Santa Ana, next at Santa Monica, will be display rooms of all appliances to which dealers can bring customers for demonstration and assistance in selling.

The TV picture

Someone else is going to take a fling with the name Majestic. Carod Corp. has bought the name and will rename its line of radio and TV sets Majestic. Other TV news: FCC has given Zenith Radio Corp. permission to run limited tests with Phonovision in Chicago for 90 days. Subscribers will pay $1 per picture to see if public will buy better entertainment. . . FCC refused to unfreeze channels despite the industry's pleas. Held tests on three color systems last month, has not announced any decision. . . RCA color was better than first tests. Hints that it may have a single tube set before long. . . Dumont, which has protested, is reported about to put out a mechanical color TV system for use in hospitals and schools. . . TV Institute & Service Assn. of Chicago tore the pants off set makers for cutting prices, saying they were skimping quality, causing inferior picture results; decried exaggerated claims about "no aerial, 1 knob control," etc. . . Talk-A-Phone Co., Chicago, has a two-way TV system via telephone lines for use in sales conferen-

ces, has asked FCC to consider it. . . Radio Manufacturers Assn. is making a strong yelp to Congress to lay off imposing a 10% excise tax on TV. Radio and appliances have been carrying this hidden tax and RMA wants some relief there too. . . To make FM pay, Sundial Broadcasting Corp. of San Francisco has a device to put on an FM receiver to tune out commercials, station breaks, etc., actuated by a high frequency beat from the station. Customers such as restaurants wanting music only would pay for this service.

Excise tax repeal on appliances and lamp bulbs was omitted from Secretary Snyder's list, who even advocated extending the tax on TV. If anything is done on appliances Congress will have to do it. — No relief

Census takers are going to be pretty nosey this year, inquiring into income, home conditions, etc., but from it should come some valuable market data broken down by states, cities, counties. It will also show where the population has shifted. The census will also get data on appliances, heating equipment, wired homes, radio sets, TV sets. — Get the lowdown

Toastmaster will reintroduce its waffle baker this spring at $18.95, and with tray and service $27.50. — Back

California Electric Service Inc., Los Angeles, repeated Feb. 25 and March 4 its service clinic for about 80 servicing dealers in southern California. First held last year, another was staged from 9 a.m. to 4 p.m. for the two successive Saturdays. More bench work and less lecture characterized this year's classes. — Train service men

Dates to remember — "Electrical Wonderland—a Midcentury Exposition of Electrical Progress," will be held in San Francisco civic auditorium Sept. 23-Oct. 1, sponsored by Northern California Electrical Bureau. . . Western Summer Market at Western Merchandise Mart, San Francisco, will be July 24-28. . . Business Development Section, Northwest Electric Light & Power Assn., will meet, Butte, May 15-17. — Dates ahead

People make news — Jim Brown, Pacific Coast service manager, Westinghouse appliance division, who has toured with yearly service schools, has been made general service manager for Westinghouse Electric Supply Co., New York. . . Carlos W. Stone, manager, Intermountain Electrical Assn., Salt Lake City, resigned March 1, to take on the distributorship for Deepfreeze products in the intermountain area. . . Guy Farwell, for 35 years with Sterling Furniture Co., San Francisco, most of them as buyer and manager of its appliance department, decided to retire suddenly, Feb. 24, and some 65 friends in the appliance industry surprised him at a Mart luncheon with an impromptu party. . . Adrian Greenberg, originator of "Kitchens Styled by Adrian" when with Union Furniture Co., San Francisco, has joined California Electric Supply Co., as Crosley kitchen specialist. . . Frank E. Johns was made representative for 7 western states for the Murray line of appliances and kitchens. . . Harvey Edmund, retired Coast Counties Gas & Electric commercial manager, and Fred Rhodes, also formerly with that company, have opened an appliance store, Rhodes, at Opal Cliffs district, Santa Cruz. . . D. Eugene Parks has been made Southwestern zone manager for Youngstown Kitchens, April 1, with offices in Los Angeles, in a new division of sales organization. . . William J. Livermore, formerly with GM Acceptance Corp., has been made Pacific Coast installment finance representative for Westinghouse, making his headquarters with J. J. Moffatt, Pacific Coast district manager, in the Mart, San Francisco. — Names news

Graybar, Los Angeles, moved to its new and much larger building at 210 So. Anderson St., having outgrown its once most modern building on Santa Fe St. First Graybar office was established in 1905. — Moves

Monitor Home Appliances has announced a new model of its popular Aerator washer with larger capacity (5 to 6 lb.), pump equipped, has fold away hand wringer, is portable and will go under a sink. Retail price is $69.50. — Larger

On-the-spot sound recordings are possible with Walkie-Recordall, weighing only 8 lb., size 4x8x10 in., having a concealed microphone, made by Miles Reproducer Co., New York. Can be used by salesmen in talks with customers and then reviewed later. — Keeps record

Sunbeam Corp. introduced a new egg cooker with thermostatic control for 1 to 6 eggs, a lid that measures water for different degrees of hardness, a pricker to puncture the shell to prevent swelling and cracking. Also is featuring a Treasure Chest promotion of six appliances in May and June to cash in on June bride business. Complete set in the chest sells at $141.95. — Eggs-actly

Westinghouse has both a 110-volt and 220-volt dryer, the former to sell to homes with only 110-volt service or use as a demonstrator to sell the 220-volt dryer to 3-wire service homes for quicker drying. Both sell at $199.95. Meetings to introduce it to dealers with sales pitch will start March 7. — Alternates

O. B. Wilt, San Francisco, now has factory representation for Duchess washers, made by Appliance Mfg. Co. of Alliance, Ohio, whose president, V. E. Dunn, attended the Western Merchandise Mart during market week. Wilt has also been doing lots of business with Luxor Drymaster, a small, portable laundry dryer. — Wash lines

New things shown at San Francisco market included: a unique iron which clamps on an ironing board, with which to press puffed sleeves, ruffles etc. It is modeled after commercial irons of the same type, designed and shown by Bessie T. Stevens, space 958B. . . Rita Electric portable oven, made by Marlum Mfg. Co., shown by G. R. Schumann, 572. . . Lostro electric blanket with built-in thermostats, needing no outside control, shown by Fred Woods, who also had Whizmaster power tools, with frames made of laminated wood. — New and different

Lee Distributing Co., San Diego, has been made distributor of the Coolerator line. . . Herbert H. Horn Co. has distribution of New Home sewing machines for San Diego and Imperial counties. — Appointed

For small homes and apartments, Hunter Fan & Ventilating Co. has developed a two-speed, electrically reversible window fan. Finished in ivory enamel with silver grille. Has expandable side panels for mounting in any standard window. — Reversible fan

With Silex's new "on-the-spot" service policy on its DS1 steam iron, Silex dealers are authorized to replace any defective iron from their stock. Dealers are given an adjustment chart to determine if an iron is acceptable for replacement. — On the spot

Hoffman Radio Corp., Los Angeles, has appointed two new distributors—Glenn Earl Inc., Salt Lake City, for the intermountain region, and Robert F. Clark Co., Denver, for Colorado, Wyoming and Billings, Mont. — Two Named

San Diego Spring Fair, April 27-30, at Balboa Park will bring together all segments of the frozen food industry--equipment manufacturers, food packers, freezer distributors, including locker plants and farm freezers, even paper companies specializing in packaging materials. Manufacturers will have their home economists there to pitch on frozen food preparation. Another activity of San Diego Bureau of Radio & Electrical Appliances, under J. Clark Chamberlain, bureau manager. — Spring Fair

March 27-29 are the dates for the Western Conference of the Canadian Electrical Assn. in Vancouver. B. C. Assn. of Radio & Appliance Dealers will have a one-day confab on the 29th tieing in part of the program with the sales and utilization bureau of the Canadian Electrical Assn. — B. C. confab

Universal has juggled geometric designs and come up with a new shaped iron called the Stroke Sav-r. Soleplate combines a cricle and point giving more ironing surface than ordinary irons. Low sloping bevel extends around the soleplate. — More iron

RMA has organized a National Television System Committee to get industry-wide agreement on technical developments in expanding TV to all parts of the country; also to establish basic standards for color TV. Committee's big jobs will be to get technical data on the allocation of channels in unused ultra-high frequencies, procedures for lifting the present FCC freeze and basic standards for future developments of color TV. — TV committee

NEMA has a barrage of advertising for distributors and dealers to push National Electric Housewares Week, April 14-22. Plan book called "Your Billion Dollar Baby" being mailed to 3,000 distributors gives helpful suggestions for putting the week across. — Push the baby

New treatment for eliminating moths, etc., is an electrical vaporizer called Moth-King which saturates a clothes closet with repellent. It's a product of Moth-King Corp. of Detroit. — Kills bugs

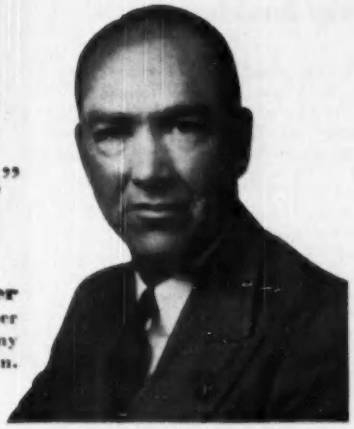
Sto-A-Way, a combination iron rest and holder, answers two ironing problems. Fireproof asbestos holder covered by a heat-resistant metal is designed to rest the iron on the board. Cord hanger fastens onto pad for storage on door or wall while iron is still hot. Made by Sto-A-Way Co., Aurora, Ill. — Protection

Gibson's ad campaign this year will stress the economy theme, carrying the headline "For Only Pennies." Dealers will follow through with the Gibson piggy bank demonstration. . . For dealer sales training Gibson is using a handy new selling guide called "The 90-Second Demonstration." Single sheets carry an illustration of the product, outstanding sales features in headline form, plus a brief paragraph for each of the points to cover. — Accent on economy

Dominion Electric Corp.'s latest, a two-beat percolator called "Sta-hot" has two controls, one for perc, one for keeping the coffee warm. Eight cup capacity, aluminum finish. Sells around $8.95. — Perc

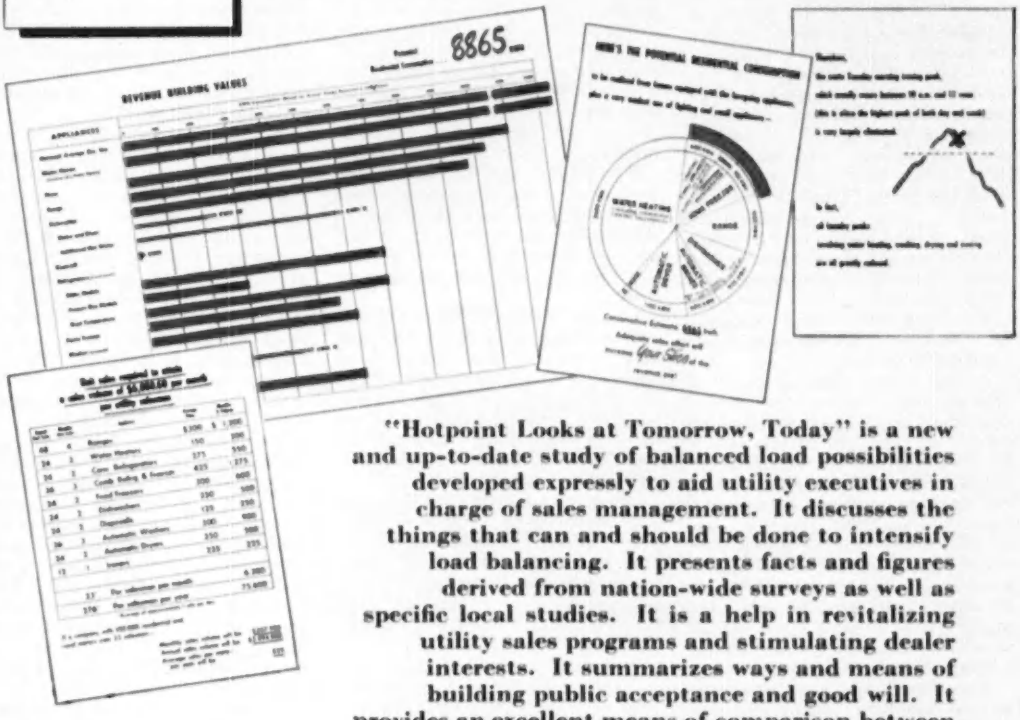
Hoover has a new deluxe upright cleaner with bright blue color scheme and such improvements as lightweight "veriflex" hose, angled converter for easier use of attachments, toe-operated adjuster, "handisac" dirt bag for quicker dirt disposal and a larger lens for the first finder headlight. — New look

"A well-rounded presentation that recognizes aggressive selling as the foundation of the industry's strength."



R. F. Pulver
Vice President and General Sales Manager
Minnesota Power and Light Company
Duluth, Minn.

Your opinion is greatly appreciated, Mr. Pulver. Incidentally, more and more utility sales executives are asking to see this study.



"Hotpoint Looks at Tomorrow, Today" is a new and up-to-date study of balanced load possibilities developed expressly to aid utility executives in charge of sales management. It discusses the things that can and should be done to intensify load balancing. It presents facts and figures derived from nation-wide surveys as well as specific local studies. It is a help in revitalizing utility sales programs and stimulating dealer interests. It summarizes ways and means of building public acceptance and good will. It provides an excellent means of comparison between your methods and those of other utilities throughout the country. ***Executives who are interested in seeing this timely, helpful analysis are requested to contact Hotpoint Utility Division, Hotpoint, Inc., 5600 West Taylor Street, Chicago 44, Ill.***

Hotpoint Inc.
(A GENERAL ELECTRIC AFFILIATE)

Group Breakdown

A new program to fit today's new conditions was launched immediately by the new officers elected last month to head the San Francisco Electrical Contractors Assn. (an NECA chapter). First meeting under the new regime, Feb. 16, drew a record attendance. Its conclusion was to hold a series of meetings of contractors interested in specific classes of work to face the facts of competitive conditions, markets, overhead and profit. With a membership of more than 120 doing all classes of work, a questionnaire to members indicated 33 members interested in knob and tube or residential wiring, 68 in small alterations and repairs, 9 in line construction, 12 in street lighting and trolley work, 76 in large alterations, 53 in large construction, 46 in industrial maintenance and 39 in motor repairs. Those in each group will meet to discuss their mutual group problems under chairmen selected by President William Kennedy.

Pretty straight talk came out at the special meeting, Feb. 16. Charles A. Langlais, chapter governor, unable to be present, had a paper which was read by Ed Scott, secretary. In it he made plain that construction business was leveling off and soon "sometime, someplace, all of us will have to operate at a lesser level," with less volume. Hence greater need to get proper overhead and profit. "Public work," said Langlais, "never has produced much profit. He who chisels most ends with the contract and often makes nothing on it." He predicted many casualties as wholesalers stabilize their prices and credit, labor stabilizes and contractors face the need to get job expense and overhead or go under.

George Abbett, speaking on jobber relations, defined a distributor as some contractors expect him to be, doing his take-off of quantities for him, selling for him, supplying him with all stocks quickly with maximum discount even for minimum quantities, financing beyond good judgment. But if he does all this, Abbett said, he sells promiscuously too. If contractors did as good a selling job as appliance dealers do for their distributors, he said, they would not sell so much direct. He advocated cleaning house and becoming a better outlet instead of criticizing.

Rudy Beard, told good humoredly of what constitutes "non-existent overhead." Taking a certified accountant's list of items of overhead he kidded by giving the excuse many use for not including such a cost, thus eliminating all and coming up with "no overhead." By contrast he told how manufacturers figure their costs of doing business on top of raw material and labor costs, reaching sometimes as much as 350% of raw costs. "Let's not apologize for overhead," he said, "Self interest is the greatest motivating force in life. Nobody questions our right to a profit. You wouldn't want to do much business for anyone who doesn't get a profit from his business, its too risky."

Kennedy Newman Smith Varley Scott

Roy Moser spoke of the importance of public relations to a contractor, dividing the subject in three parts—relations with the public, human relations with employees and competitors and proper mental attitude. Contractors, he maintained, should be good citizens and neighbors. They should help fellow members when in distress instead of hurting them. They should not be calamity howlers or defamers of competitors. He also outlined the association's program of public relations activities.

Manager William J. Varley followed with a review of legislative and local administration problems being worked on. President Kennedy then announced a schedule of group meetings for those in various classifications of work. Past president Wes Baker compared the plumbing and sheet metal industries in respect to electrical.

Officers elected by the San Francisco association recently were: W. T. Kennedy, president; R. E. Newman, H. S. Tittle Co., vice-president; E. W. Scott, secretary; George D. Smith, treasurer; and as directors, Louis Ets-Hokin, P. J. Furlong, William Schultz, Lee Malm, Jack Cimino, Bert Doherty and E. J. Weber.

NECA

Date for the District 8 annual meeting, National Electrical Contractors Assn., has been set as May 5-6, at Hotel Newhouse, Salt Lake City, G. A. Howarth, manager, Utah Chapter, is in charge of arrangements. National officers of the association are expected. The meeting will draw contractors from Montana, eastern Idaho, Wyoming, Utah and Colorado.

District 6 meeting, originally scheduled for June, changed to May 11-12 to fit in with the travel schedule of eastern officers, may have to be held in June after all, according to E. R. Cornish, Pacific Coast representative, because accommodations at Davenport Hotel, Spokane, will only be available at the June 9-10 dates.

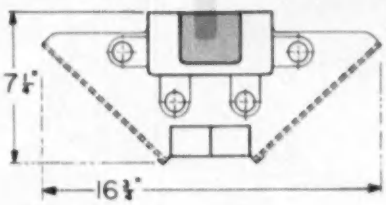
On his return from the NECA administrative committee meeting late in February, J. D. O'Connor, District 6 vice-president, intends to attend and report to all chapters in the district. The first scheduled is March 1, at Portland, where both the Portland Chapter and Northwest Line Constructors Chapter will meet. A meeting then in Spokane, another in Seattle, will be followed later in California with various chapters there. E. R. Cornish plans to accompany O'Connor and bring details of the educational and sales programs of NECA to the membership.

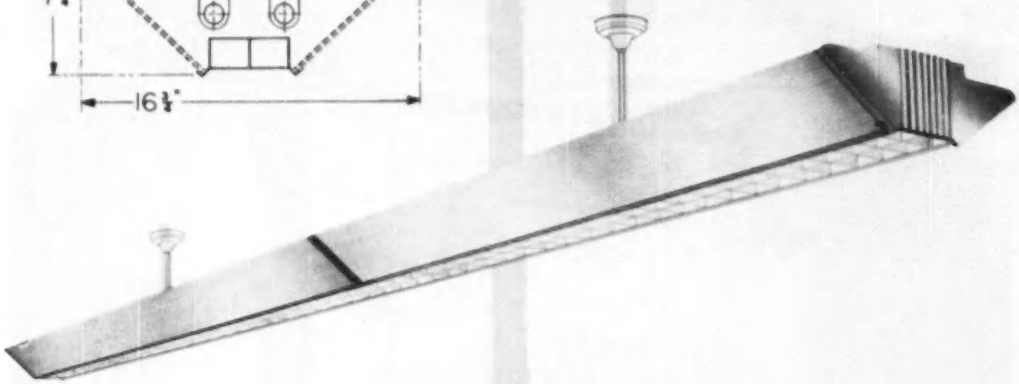
Presidents of the Inland Empire Electrical Dealers Assn., Claude Edgren of Colfax, and of Spokane Chapter, NECA, E. B. DeFeyter, announced the consolidation of administrative facilities of the two organizations and appointment of Robert Wilkinson, of the former, as manager for both. "The associations have many mutual interests which can be coordinated more effectively. However, they will remain entirely independent in regard to policies and direction under their respective officers." Both organizations plan strengthened programs, more membership, increased territorial service. The contractors want some of the business analysis and management improvement programs such as Wilkinson has given the IEEDA. New offices are at 501 Empire State Building, Spokane.

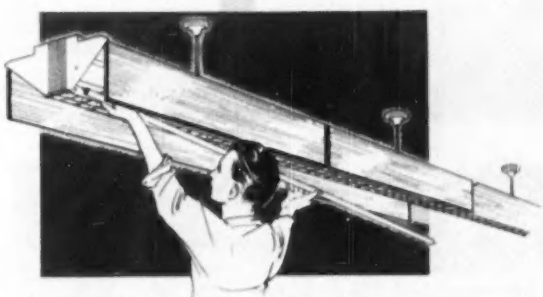
A NEW HIGH IN INSTALLATION AND MAINTENANCE EASE with SUNBEAM'S 640 Series

Shown here are just a few of the many features incorporated in all SUNBEAM fixtures which keep installation and maintenance costs way, way down. The 640 Series is typical of SUNBEAM'S luminaire designs. This new unit is designed for single or continuous run installations for ceiling or pendant mounting. One-man fixture installations are made possible by use of a heavy gauge hook-on hanger bar. For continuous runs, the fixtures are coupled together with ¼" bolts through the ends and no extra parts are required.

The L640 Series is available in 2, 3 and 4 lamp 40 watt fluorescent and in 96-inch, 200, 300 and 430 milliamp slimline versions; the latter being equipped with the new 75 watt T-12 lamps. The 2-lamp pendant mounted units have a remarkable efficiency of 84%. The metal egg crate louver provides 37° by 37° shielding, and the glass side panels are uniform in brightness.







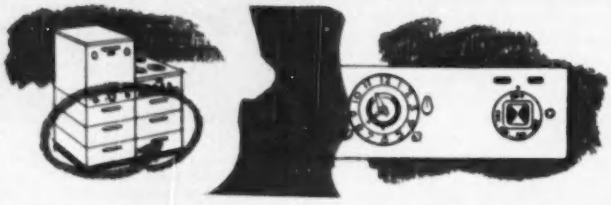
This shows the simplicity of maintaining SUNBEAM'S L640 Series. The glass side panels are rigidly framed and swing outward from the bottom. The one-piece, 8-ft, progressive die-formed louver does not have to be removed for relamping, but is easily removed if desired.

SUNBEAM LIGHTING COMPANY • 777 EAST 14TH PLACE • LOS ANGELES 21, CALIF.
manufacturers of BFK lighting fixtures

UNIVERSAL *presents*

Here it is! The sensational *Select-a-Range* with the exclusive "Convenience-Level" oven!

NOW! RIGHT OR LEFT HAND OVENS! "Convenience-Level" can be set to any desired height, right or left, for tall or short people to eliminate back-breaking stooping, squatting and bending!



NOW! 100% MORE STORAGE SPACE! Increased storage drawer capacity provides more than twice as much utility space as conventional ranges! *All* your utensils are now at your fingertips!

NOW! SAVE TIME WITH AUTOMATIC COOKING! Automatic Clock starts and stops oven without attention. Automatic push-button Pre-Heat Control. Just set it ...then forget it. No watching or guessing!

THE *Select-a-Range*

IT'S NEW!

IT'S REVOLUTIONARY!

IT'S EXCLUSIVELY UNIVERSAL!

New markets for you! . . . Greatly increased turnover with reduced inventory! . . . Exclusive, dramatic "Convenience-Level" oven! . . . More sales through kitchen planning flexibility! That's why...

EVERY DEALER SHOULD HAVE THIS AMAZING NEW KIND OF RANGE IN HIS STORE!

1. The Select-a-Range gives you the widest range line in the industry. Now you can sell a range for the smallest cottage or the largest mansion . . . from minimum to maximum cooking requirements. Now you can sell the building market with a range designed and priced for any project . . . new building or modernization. Now you can sell the institutional market with a range big and flexible enough to meet requirements.

Here are new markets, broader markets never before open to you in range selling!

2. One Select-a-Range on your floor is all the inventory you need to do a complete selling job compared with 6 or 8 models of a conventional line. Instead of turning over your range investment four times a year, for example, Select-a-Range turnover is 24 times! Just one Select-a-Range gives you a line of more than 25 models!

Reduced inventory . . . increased turnover . . . equals greater range profit for you!

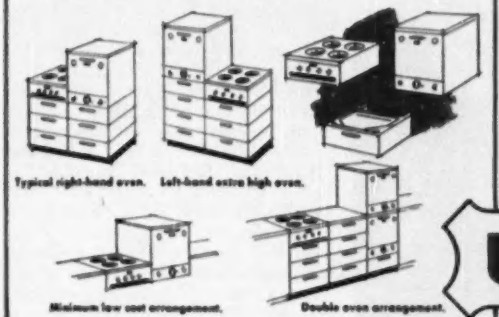
3. Select-a-Range is the *only* range with the much desired no-stoop "Convenience-Level" oven. Surveys show that over 25% of your customers want a *high* level oven. Now they can have it . . . it's exclusively Universal . . . a "Convenience-Level" oven at the height your customer selects . . . exactly as she wants it.

Here is a great sales advantage for you that no other range line can match!

4. Select-a-Range *multiplies* your opportunities to sell *complete* kitchens . . . 25 arrangements to meet your customer's most exacting whims. Your kitchen planning problems are simplified with fresh new designs by the nationally famous Royal Barry Wills . . . Select-a-Range models and other sales helps.

Call your Universal distributor today or write immediately to Landers, Frary & Clark for complete details. Be the *first* in your town with the sensational Select-a-Range!

OVER 25 VARIATIONS FROM 3 BASIC UNITS!

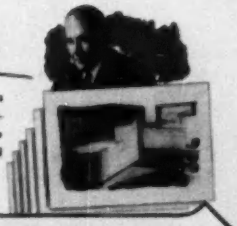


Typical right-hand oven. Left-hand extra high oven.

Minimum low cost arrangement. Double oven arrangement.

Royal Barry Wills

nationally famous small homes designer,, has planned six new sterling kitchens around the sensational Select-a-Range. Featured in Select-a-Range national advertising, they have also been included in your kitchen planning kit to help you sell!



UNIVERSAL

LANDERS, FRARY & CLARK, NEW BRITAIN, CONN.

IEEDA plans a large spring sales meeting series beginning at Spokane on March 15. The NECA District 6 meeting will be held in Spokane in June.

New Officers

Sacramento Valley Chapter, NECA, elected a group of young contractors to lead its activities in 1950 at its Jan. 3 annual meeting. Fred Carlson, Grayson Electric Co., president last year, presided. James Mapes was elected president, Jim Newmarsh, vice-president, Louis Stein, secretary, and W. E. Cotter, treasurer. Frank Merwin, veteran contractor, was named governor last year and remains in that post. William Welsh is manager. Retiring President Carlson goes on the board of directors. Paul Benge is the other board member beside the officers. Speakers at the annual banquet included E. R. Cornish, Pacific Coast director NECA, W. A. Cyr, ELECTRICAL WEST, J. D. O'Connor, District 6 vice-president, Ed Grogan, San Joaquin County Chapter manager, Arthur E. Rowe, San Francisco Bid Depository custodian, Ed Buttner, Oakland, who spoke of contracting conditions in England, and Ernest Kramm, Northern California Chapter manager.

San Joaquin County Chapter, NECA, held its annual meeting Jan. 11 at Lodi and had much the same program of speakers—Cornish, Welsh, Rowe. The chapter re-elected its board of directors and officers for 1950. They are J. E. McCarty, president; D. R. McGinnis, vice-president; Ray P. Parker, treasurer, and E. H. Grogan, secretary-manager. Paul Curtis and Ewald A. Menzel are the other board members. R. Goold is governor.

Northern California Chapter, NECA, recently re-elected its officers also. They are W. A. Goulart, Richmond, president; William Bassett, Oakland, vice-president; W. A. Cyr, treasurer, and Dan Bronson, governor. Ernest Kramm was named permanent manager.

RMEL

A two-day Spring Conference is being planned by Rocky Mountain Electrical League for March 27-28, at the Shirley-Savoy Hotel, Denver, according to Ralph Hubbard, manager. Concurrent meetings of the committees will begin the morning sessions both days; joint luncheons will be held each noon; a general session Monday afternoon, and a dinner meeting with a featured speaker, Monday evening. After inspection trips Tuesday afternoon the banquet will be held Tuesday evening. Sponsors for the committee meetings are: accounting, W. J. Quinn; adequate wiring, Albert W. Tracy; engineering, L. M. Robertson; mobile radio communication, James C. Livesay; publicity and advertising, M. A. Rowley; rural electric, Warren Terry; sales and promotion, H. T. Rankin. On Wednesday, March 29, General Electric Co. will hold a special power conference. Fall conference dates also have been set by RMEL. It will be held at the Broadmoor Hotel, Colorado Springs, Oct. 8-11.

IAEI

Series of annual meetings of chapters of International Association of Electrical Inspectors in the Rocky Mountain region were given tentative dates as follows: Rocky Mountain Chapter, Denver, March 30-31, Cosmopolitan Hotel, Victor Moulton, secretary; Utah Chapter, Salt Lake City, April 13-14, Eugene Fleming, secretary; Idaho Chapter, April 17-18, place not announced, Harold Rising, secretary; Montana Chapter, Billings, April 20-21, Walter Lindsay, secretary.

Arizona Chapter held its last meeting at Safford, Ariz., and was addressed by H. G. Ufer, Underwriters' Laboratories; Cecil Clark and Earl Trankle. Subjects were the IAEI, good inspection, standardization of codes and reinspection. Next meeting is scheduled at Glendale, Ariz., at which its Inspector Clark will select subjects, act as host, March 11.

Central California Chapter held its Feb. 11 meeting in Fresno to elect officers, discuss hospital wiring, see an educational movie and discuss the code.

Next meeting of the Southern California Chapter, IAEI, will be held at Compton, with a trip to Southern California Edison Co. plant at Redondo and talks by Wayne Johnson and R. C. McFadden, vice-presidents of the company. The previous meeting at Ventura covered many proposed changes in the California Electrical Safety Orders. A recommendation earlier in discussion of a model inspection code, that extra outlets be permitted on multioutlet assemblies where the circuit was protected by a non-temperable overcurrent device, drew considerable discussion.

IES

Some of the fundamentals needed for more intelligent engineering both of panel lighting and panel heating were discussed before the Northern California Section, IES, Feb. 9, by Louis Possner. He is project engineer for thermal radiation study at University of California. While nothing startling or new the studies may result in basic data for future application in these two fields. Chairman Dan Finch, UC, presided.

Architect John Wade told what an architect's approach to lighting is at the last B. C. Section meeting of IES. D. W. Patterson of Amalgamated Co., Ltd. was scheduled to talk on sports lighting at the Feb. 16 meeting.

The new deluxe red phosphor fluorescent lamps were scheduled to be demonstrated to the Mother Lode Chapter, IES, at Sacramento, Feb. 23, by Sam Hazleton, lighting engineer, General Electric Lamp Department.

Architects and IES held a joint meeting, Feb. 1, in Los Angeles, each with two speakers on an unusual program, one for which a similar follow-up has been suggested. Oscar W. Meissner, IES chairman, told "What Is Illuminating Engineering"; Walter R. Hagedohm, AIA, "Why an Architect." Victor Gruen, AIA, and foremost store designer, spoke of "Design with Light." J. Walter Howard, G-E Lamp Department, projected "Lighting Tomorrow." Herman C. Light substituted for Paul O. Davis as liaison officer between the two associations. For the March 1 meeting Charles I. Brady, manager, south Pacific division, Sylvania Electric Products was scheduled to give a "Cross-Country View of Lighting." IES national president, Charles Goddard, is expected in April,

Merwin Carlson Mapes Newmarsh Stein Cotter

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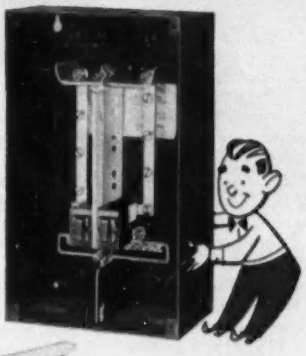

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Push-button switch with automatic protection for electric circuits.

THERE's a Pushmatic to meet every load condition: THERMAL ONLY, THERMAL-MAGNETIC, and THERMAL-MAGNETIC with exclusive AMBIENT COMPENSATING FEATURES. All are identical in size and contour, in ratings of 15, 20, 30, 40 and 50 amperes, 1 pole, 120 V., or 2 poles, 120-240 V., AC. All are interchangeable for rating and type.

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2 additional Pushmatics of the desired rating and type from his shelves for . . .

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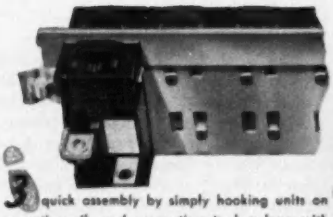
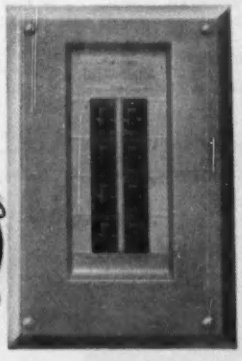


3 quick assembly by simply hooking units on mounting rib and connecting to bus bars with screwdriver. Individual Pushmatic units are easier to add or interchange than multiple units, too!



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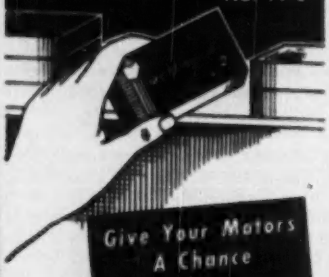

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In Catalog 19-E, brushes are listed alphabetically by motor and equipment manufacturers name. At least 15,000 styles of motors are listed. It's a plain "dollars and sense" policy to order an adequate stock of emergency brushes, a few sets of each, and preserve economy in your motor maintenance.

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at which time the meeting will be held jointly with the Electrical Maintenance Engineers Assn.

Southern California Section of IES met jointly with the American Optometric Assn. recently. Program covered the problems and relationship between the optometrist and illuminating engineer in serving the public. . . . Special ladies night recently was keyed to feminine tastes with a demonstration and discussion on lighting the ladies' domain. . . . Meeting scheduled for January will be devoted to lighting certification programs.

The following committee chairmen have been named to arrange for the National Technical Conference of IES to be held at the Hotel Huntington, Los Angeles, next August: Don Prideaux, general convention chairman; A. B. Smedley, hotel; J. Walter Howard, local publicity; J. M. Smith, transportation; Don Grandey, finance; William J. Rashleigh, entertainment; Louis D. Black, lighting display and decoration; M. A. Cabot, attendance.

A detailed report on color, including light and color, the visual processes, color and architecture, was presented by John W. Boylin, Department of Fine Arts, University of Southern California, at a joint meeting of the American Institute of Architects and the Mother Lode Chapter of IES in Sacramento.

A course in lighting fundamentals started recently under the auspices of the B. C. Chapter of IES.

Northwest IES Conference

President Charles H. Goddard of Illuminating Engineering Society and several other Eastern lighting notables will participate in the Northwest Regional Conference, to be held March 23-24, in Edmond Meany Hotel, Seattle. Goddard, manager of utility sales, Sylvania Electric Products, New York, will be on the program. Robert Bardsley of Sylvania will speak on color. Monte Cutler, General Electric Lamp Department, Nela Park, will talk on store lighting; A. A. Eastman, same company, on solving of visibility problems and measurements. R. J. Swackhamer, General Electric Co., IES sports lighting committee chairman, will discuss the work of IES committees. Fred Cooper, Westinghouse Electric Corp., will talk about ultraviolet applications. Other speakers include Eric Ackland, IES North Pacific Region vice-president; Bert Heinz, conference chairman; Waldo B. Christenson, president of AIA. The second day will be devoted to parallel meetings on a variety of topics with discussion leaders. Full report on the conference will be digested in the May issue.

Smith Holloway Maxwell

Electric Clubs

Transformer winding was the basis for the second annual joint contest sponsored by the Electric Club of San Diego and the board of education of San Diego. And Jan. meeting was the award luncheon. R. J. Smith and Bob Maxwell, students at Hoover High School won first prizes of $50. Six more prizes were awarded to other teams of boys who entered and completed the contest. It was to take a burned out transformer, furnished by San Diego Gas & Electric, rewind and rebuild it. Hoover High School also won the $100 award in electrical equipment for its shop. There were 15 transformers taken out, 13 completed, among three high schools. Six committees of the Electric Club had worked under President J. F. Sinnot since Oct. 4 on the project. Charles W. Patrick, school director of vocational education headed a school instructor committee. Presentation of prizes was made by A. E. Holloway, president San Diego Gas & Electric Co., from contributions and prizes donated by eight suppliers and the utility.

NISA

W. M. Hogue of Larsen-Hogue Electric Co. Los Angeles, was elected Region 15 board member for the National Industrial Service Assn. Oregon Chapter recently elected Curtis Johnson, Marine Electric Co., chairman, Victor Hunt, vice-chairman and Ray Losli, Skeen Electric Works, secretary-treasurer.

AIEE

"The Engineer Can Be Wrong" was the iconoclastic title of a talk to the San Francisco Section, AIEE, by Dr. Joseph Slepian, associate director, Westinghouse Research Laboratories, East Pittsburgh, on Feb. 24.

Outgoing president of EMEA of Southern California, Homer M. Eversz, left, turns over the gavel to association's newly elected president, H. S. Davis of General Electric Co., during the ceremony at the group's February meeting

EMEA

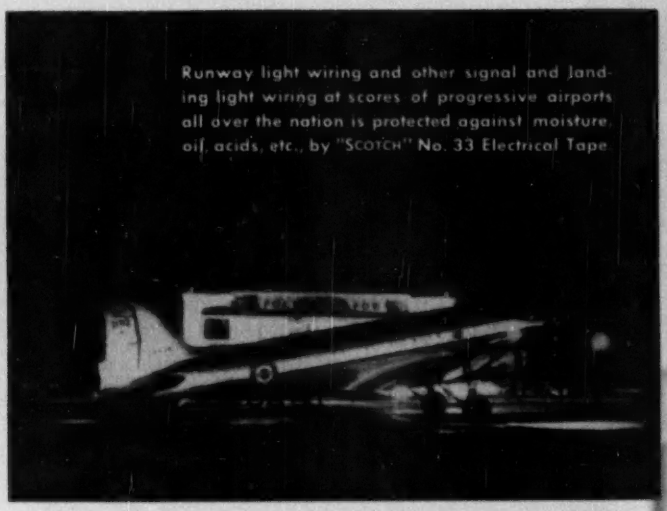
Some 80 exhibitors representing 200 manufacturers are scheduled to display their products at this year's Industrial Electrical Show from March 15-18 at the Shrine Convention Hall in Los Angeles. The show is a yearly event of the Electrical Maintenance Engineers Association of Southern California. (Story and pictures next issue.)

EMEA's 1950 executive committee is headed by Harold S. Davis, General Electric Co., president; Frank J. Rohring, Southern California Edison Co., first vice-president; George Larsen, Larsen-Hogue Electric Co., second vice-president; Richard Rogers, Ace Day & Nite Co., secretary-treasurer; and John T. Benson, Henry R. Bente, Elmor M. Croft, Bob Paden, Ralph B. Weston.

Election was held at the group's January meeting, followed by an illustrated talk on fuse demonstration from J. A. Derque and W. J. Wilt of Bussmann Mfg. Co. E. E. Carlton, Division of Industrial Safety, reported on state safety orders meetings and answered code questions.

February meeting with installation of new officers also featured the Square D Co.'s *Circuit Breaker Circus*, with demonstrations by Charles Croft and Walter Reuland, field engineers of Square D. Code discussion was led by Ed Muller, State Division of Industrial Safety. . . . April meeting will be held jointly with IES.

EMEA of Northern California met in San Francisco on Feb. 24 for a program featuring J. M. Dodds, General Electric Co., with a talk on jet propulsion for aircraft and gas turbines.


Runway light wiring and other signal and landing light wiring at scores of progressive airports all over the nation is protected against moisture, oil, acids, etc., by "SCOTCH" No. 33 Electrical Tape

How plastic tape helps make night landings safer

EMERGENCY TOWER FEEDER at the Houston, Texas Municipal Airport being insulated with "SCOTCH" No. 33 Electrical Tape. Plastic backing of tape is abrasion-resistant, withstands moisture, won't crack, chip or peel. Wiring recently weathered a 90-mile-an-hour hurricane with no damage.

FIELD LIGHT WIRING splices at the Houston Airport are dependably protected with "SCOTCH" No. 33 Electrical Tape. This is only one of the many insulating problems that can be solved with "SCOTCH" Electrical Tape. Write Dept. EP-350 for complete information, today. There will be no obligation.

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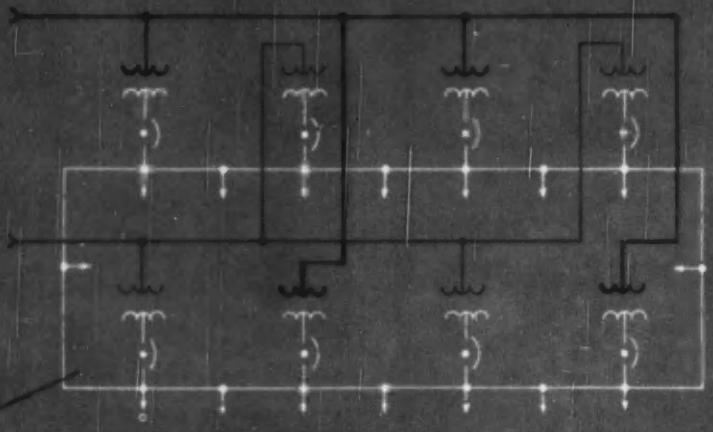
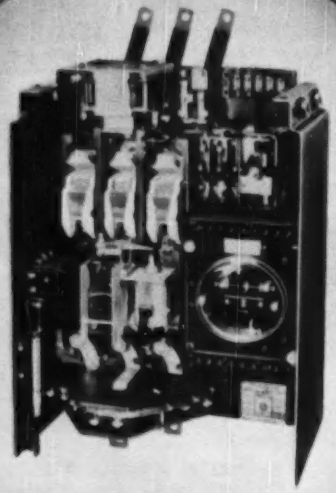


The secondaries of this low-cost, overhead system usually form a loop, as shown here. The loop is a 3-phase, 4-wire overhead circuit consisting of open-wire or cabled conductors. Power is supplied to the secondaries through distribution transformers and associated network protectors.

THE KEY TO THE SYSTEM . . .

The Westinghouse CM-88 Network Protector

The protector is an automatic, electrically-operated air circuit breaker, controlled by network relays. It was specifically developed to provide the economical answer to light-duty, overhead secondary network systems. It comes in a weatherproof housing, arranged for direct pole mounting. Two ratings are available for use with 150 K.V.A. 3-phase bank and smaller transformer banks.



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Now, small outlying business sections in large cities, heavily loaded residential areas, and commercial districts in small cities and towns . . . can have high-quality network service . . . *at a cost comparable with that of the ordinary radial system.*

REASON:

EXISTING SYSTEM EQUIPMENT CAN BE USED!

PRIMARY FEEDERS, now existing, can often serve a light-duty overhead secondary network with only a few additional lateral taps. Present transformer capacity can remain practically unchanged because overhead feeders can be restored to service quickly after a fault occurs.

TRANSFORMERS, of the standard type, now existing, can often be used. Three-phase network transformer banks required in this system can be formed by using your present single or three-phase transformers. Installation of a standard Westinghouse 3-phase distribution transformer will accommodate load growth easily . . . economically.

SECONDARIES now existing, may be used in many cases. Since both power and lighting loads are served from the same network secondaries, the copper now on your poles may be more than enough to form the three-phase, four-wire secondaries.

CONSUMER SERVICES—many can remain unchanged.

May we be of help in YOUR network planning? Call your nearest Westinghouse office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-97141

For a more complete discussion ask for a copy of Central Station Digest, No. 26. This issue is devoted entirely to analysis of overhead secondary network systems, their advantages and economics. You'll find it timely, authoritative and helpful.

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THE MONTH IN BRIEF

PP&L Stock Will Go to Western Investors

A syndicate of Pacific Coast underwriting houses will offer common stock of Pacific Power & Light Co. to Western investors, according to A. C. Allyn & Co. and Bear, Stearns & Co., representatives of the group which last month won SEC approval of a $16,125,000 purchase of the stock from American Power & Light. J. Douglas Casey, Allyn Co. president, and Donald C. Lillis, Bear partner, answered reports that PP&L would be sold piece-meal to PUDS in Oregon and Washington by a declaration that the new owners plan to lease the system "exactly the way it is." They also denied any plans for purchase of Portland General Electric Co., which had been proposed by R. J. Van Ingen & Co., whose bid for the PP&L stock was rejected by SEC. The new owners say they will offer the stock for sale within six to nine months. Under SEC regulations, it must be sold within two years.

Guy Myers Not on List

Absent from the successful purchase syndicate in the PP&L stock deal was the name of Guy C. Myers, New York broker, who has been a figure in public power transactions in the Northwest. A PP&L statement said: "It was made very clear in the SEC hearing that Guy C. Myers has no present or prospective connection with the reconstruction group which made the successful bid."

PUDs May Bid for Properties

Despite the announcement that PP&L will be continued as an operating company under present management, co-ops operating in eastern Washington and Oregon have proposed negotiations for purchase of the properties. At a Pendleton, Ore., meeting, representatives of 15 PUDs appointed a committee to meet with representatives of the purchasing syndicate.

Appeal on Appeal

Idaho Power Co. said last month that it would ask dismissal of a government appeal in the "trespass" battle between the company and Interior. The government filed notice of appeal after retired Federal Judge Charles Cavanah ruled that the power company was not trespassing on public lands in construction of its Boise-American Falls transmission line (EWEST, January, p. 98). Power company officials state that the government appeal was filed after the time for making an appeal had expired and that the Appellate Court was without jurisdiction, that the court order denying plaintiff's motion to vacate the judgment was not appealable and that questions involved in the government appeal have become moot.

Rehearing on Rehearing

Latest round in the Kings River, Calif., power development battle at FPC: rehearing on rehearing. Pacific Gas and Electric Co. has filed a request for rehearing on the commission's order granting a rehearing as asked by the Secretary of the Interior. The rehearing granted at Interior's request is scheduled for March 20. Meanwhile, in California, Governor Earl Warren has come out for development of the Kings River water resources as an integral part of the Central Valley project (see story on page 110).

Foreign Bids May Be Expected

City of Seattle may have to face again the problem of what to do with bids from foreign electrical manufacturers. Several months ago, two British concerns underbid U.S. firms on transformers for City Light's new Ross power house. (EWEST, January, p. 98). The bids were rejected, however, as not being in accord with specifications, and the contract was given to General Electric because of its experience in building the type of transformers wanted. William C. Foster, acting administrator of the ECA in Washington, D. C., to whom the British firms had appealed for help, expressed the opinion that the city had not acted unfairly. Since then, however, the city has received requests from three British manufacturers, one French and one Italian firm to be kept advised of future bid calls for transformers and other electrical equipment. The Swiss consul also has asked for information.

USBR Water Survey in Progress

What surplus water, if any, may be available for export from the Northwest to water-deficient areas of the West will be determined by the USBR in its United Western Investigation. The survey was initiated last year through a special project planning office established in Salt Lake City and is to be completed in 1952. In a release last month, S. P. McCasland, engineer in charge, said that investigation would be made of means of compensating for any disadvantage to existing or future power production resulting from export of water otherwise utilizable for power. Exploration will be made of the possibility of using steam power for this purpose, it was stated.

Central Arizona Project Passes Senate

A bill authorizing the Central Arizona project was passed on the floor of the Senate last month. Authorization is subject to decision by the Supreme Court on the present controversy regarding adjudication of the Colorado River water rights.

Merwin Unit Will Reduce Purchases

Pacific Power & Light Co.'s new 45,000-kw. generating unit at Merwin plant on the Lewis River in Washington, will reduce the company power purchases by about $750,000 a year, President Paul B. McKee said in a recent letter to stockholders. The new unit was put into service last December.

Tax on Electrical Energy Up

The federal tax on electrical energy showed a gain in 1949 over the previous year, reflecting increased sales, it was reported by the Bureau of Internal Revenue. In contrast, declines were reported for collections on light bulb and appliance taxes.

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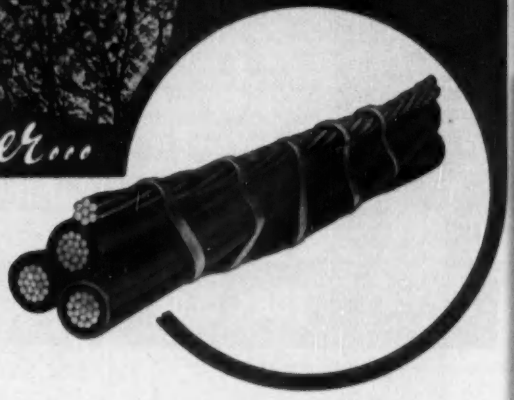

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GENERAL ELECTRIC

THIS MONTH'S NEWS

Governor is for Federal Development of Kings River

California's Gov. Earl Warren has come out in favor of development of the Kings River water resources as an integral part of the Bureau of Reclamation's Central Valley project.

If Congress does not authorize the development as part of the CVP, the governor added, local water, irrigation and power districts should get the next priority, provided that any plan proposed by these districts should include public development and use of electric power.

His recommendations were contained in a report approving the feasibility of and the need for the project prepared for Secretary of the Interior Oscar L. Chapman. Secretary Chapman had asked the state's views on a proposed Interior report to Congress on the North Fork Kings River development sponsored by the bureau.

The Federal Power Commission recently approved the application of Pacific Gas and Electric Co. for development of the river's resources, but now has scheduled a new hearing on the matter at the bureau's request.

Sale prices proposed for Kings River power by the Interior report cannot support the project, however, Governor Warren's report declared.

Reclamation had figured prices at 5.1 mills per kwh. for firm power and 3.3 mills for non-firm power. The California report stated that to make the project financially feasible, prices should be 5.9 mills per kwh. delivered from Pine Flat switchyard and at least 7.9 mills for delivery from the substations along the Friant-Kern Canal and along the transmission line from Pine Flat to Tracy.

The entire power output would have to be sold at 8 mills or more per kwh. to make the Kings River a financial asset to the CVP, Governor Warren said.

Provision for a steam electric plant to firm the hydro energy should be included in the development, the governor said, at a cost that "might" be as much as $15,000,000. He asked further study on the amount of the cost of the Pine Flat reservoir which should be allocated to power and added to the cost of the Kings development. He believed the allocation should be substantially greater than the $1,400,000 mentioned in the Interior report.

Any power development on the river will depend on the reregulating facilities of Pine Flat Dam, now under construction by the Corps of Engineers.

He commented that the figure included in bureau estimates for purchases of PG and E's present Balch power plant on the river "appears to be too low."

The governor's report was based on a study made by the State Division of Water Resources and submitted to him by Director of Public Works C. H. Purcell.

No Change in Rate for Five Years, BPA says

No advance in power rates charged by the Bonneville Power Administration is possible for five years, Bonneville officials explained, commenting on a statement by H. R. Stinson, counsel for the Bureau of Reclamation at Boise, Idaho, at a hearing before the Senate interior committee.

Stinson said in his testimony that, taking into account the existing Bonneville and Grand Coulee power plants and authorized Army projects, such as McNary Dam, and discarding the irrigation subsidy requirements of the Columbia Basin project, present estimates in terms of present costs, are that the existing rate of $17.50 a kilowatt year will have to be increased.

"This," he said, "is the result of the high costs now being incurred in connection with the various recently authorized projects."

It was pointed out by Bonneville officials at Portland that its rate structure is subject to review only every five years, and that this review has just been completed. It was also stated that Stinson was discussing what might happen in the future and that management of government power generation and distribution facilities had not admitted that any increase might be required.

Idaho Has Preliminary License for Snake Dam

FPC has issued a three-year preliminary license to Idaho Power Co. for investigation of a hydroelectric development on the Snake River in southwestern Idaho. The proposed project would be located in Ada, Canyon and Owyhee counties. It would include a reinforced concrete and earth-filled dam about eight miles north of Murphy; a reservoir approximately 12 miles long with a surface area of 950 acres; a power house with three 13,500-hp. generating units and space for a fourth machine.

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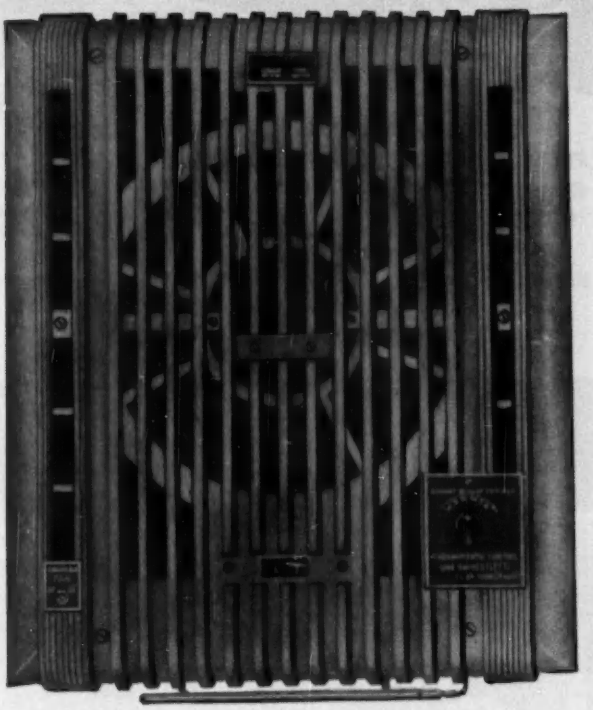

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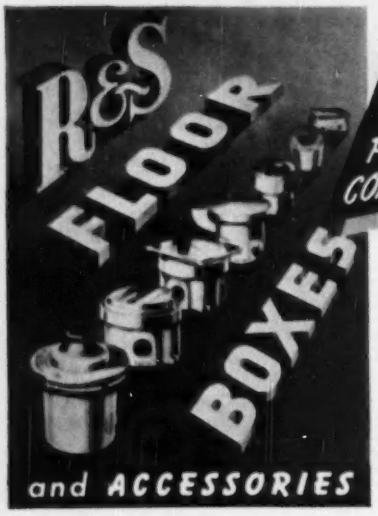

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WATER USERS MUST ENTER CONTRACTS, BOKE WARNS

Richard L. Boke, regional director of the Bureau of Reclamation, last month warned California's Kings River Water Users Assn. that if it refused to enter contracts for repayment of irrigation costs of Pine Flat Dam, Congress would be asked to halt appropriations for the project.

The association rejected a first draft of a water contract, declaring "it ignores the realities of the Kings River situation so completely it cannot be used even as a basis for further negotiations."

Philip A. Gordon, association president, said, "We definitely are not going to sign any contract which gives away the (water) rights we hold under the laws of California."

Costs chargeable to irrigation on the $43,000,000 project under construction by the Corps of Engineers are estimated by the bureau at $14,250,000.

Boke declared that, if the present deadlock continues, "As a minimum measure we will advise the Army Corps of Engineers the project can be operated only for flood control purposes.

"As a stronger measure, and probably one which will follow if a complete breakdown is apparent, we will recommend no more appropriations be granted until repayment contracts have been negotiated."

He pointed out a precedent for such action in Congress's refusal to spend funds for the Santa Barbara project until contracts were signed.

The Kings River association has contended that the dam is being constructed merely as a flood control project, with irrigation benefits incidental, and that the project does not supply additional water which is not subject to existing water rights.

The association has agreed to consider $14,250,000 as the value of the irrigation benefits, but objects to the contract's omission of any provision for the administration of storage and release of irrigation water by the owners of water rights.

● FPC has dismissed a complaint charging six manufacturers of traffic signals and related equipment with combination and conspiracy to restrain competition. Respondents were: Crouse-Hinds Co., Syracuse, N. Y.; General Electric, Schenectady, N. Y.; Eagle Signal Corp., Moline, Ill.; Signal Service Corp., Elizabeth, N. J.; Automatic Signal Corp., East Norwalk, Conn.; and Horni Signal Mfg. Corp., New York.

1950 . . .
Our Industrial Machine Is Running Down

In his recent Economic Report to Congress President Truman chalked up a constructive advance in his economic reasoning. He pointed out that if we are going to attain the worth-while goal of a $300 billion national income in the next five years, we must equip ourselves with more and better industrial tools. Of all the dynamic forces of expansion in America, he said, one of the most important is business investment.

That is fine. It is basic common sense. We have been saying that for years and we are glad to hear the President say it too.

But having hit this new high in his economic reasoning, the President failed to draw the right conclusion. He made the mistake of accepting the false conclusion that there is no shortage of business funds to pay for more and better industrial tools. "There are immense opportunities for business investment in nearly every segment of the economy," the President said, and further, "there are in general sufficient funds available to businessmen who want to seize these opportunities."

That just is not so — and the lack is not only serious; it can well be fatal.

It is a matter of the most urgent national importance that the President's recognition of the need of more and better industrial tools should be followed by effective action. *That calls for changes in the national policies that are now blocking and, unless changed, will increasingly block business from meeting this need. If business cannot get enough new tools, the result will not be higher, but lower standards of living five years from now.*

The President should talk this matter of business investment over with Senator O'Mahoney, the Chairman of the Joint Congressional Committee on the Economic Report. Senator O'Mahoney would take to the discussion knowledge of the investment situation recently acquired through his conduct of a series of Congressional hearings.

If he told the President what he told the press during the course of these hearings, he would say, "the private capitalistic system is being seriously threatened by a lack of venture capital." That is in direct conflict with the President's conclusion that "there are in general sufficient funds available."

This serious shortage of adequate investment in new plant and equipment is brought forth so that all of us can understand it by McGraw-Hill's annual survey of American industry's plans for investment in new plant and equipment in 1950, which has just been completed.

continued on next page

BUSINESS' PLANS FOR 1950

These are the major findings of the McGraw-Hill survey of "Business' Plans for New Plants and Equipment" in 1950. Made by the McGraw-Hill Department of Economics, the survey shows:

1. Industry—as represented by manufacturing, mining, transportation, and utilities—now plans to invest $12.4 billion in new plants and equipment this year. This is 13% less than was actually spent last year.

2. Manufacturing industries alone plan to spend $6.3 billion in 1950 for new facilities. This is also 13% less than they spent last year.

3. Manufacturers as a whole expect their 1950 sales volume to about equal 1949's.

4. Manufacturers will expand their capacity about 3% in 1950, under present plans. The largest part of their funds, 65%, will go to replace and modernize existing facilities.

5. Profits and reserves are expected to provide 92% of the 1950 investment funds of manufacturing companies. These companies count on new common stock issues to provide less than one-half of one per cent of the investment funds they will need.

6. Two out of three manufacturing companies review their investment plans monthly. Almost all companies go over them at least quarterly. The survey shows that companies changed plans rapidly during 1949 to meet changes in their prospects.

7. Other industries are also reducing their investment plans in 1950 by 13%. This coincidence arises from the fact that utility companies, notably the electric light and power companies, plan to spend only slightly less than in 1949. Railroads, on the other hand, are reducing their capital programs in 1950 by more than 40%.

A copy of a complete report on "Business' Plans for New Plants and Equipment" may be obtained by writing me at McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York 18, N. Y.

The results of the survey, which are summarized above, show that American Industry—as represented by manufacturing, mining, transportation and utilities—is planning to spend 13 per cent less for new plant and equipment in 1950 than it did in 1949.

Since the rate of investment in new plant and equipment right now is apparently about 15 per cent below the rate for 1949, the present level of business investment may be relatively steady in 1950. That would relieve the fear, expressed by President Truman in his Economic Report, that "if the downward trend in business investment were to continue, our prospects for full recovery and continued expansion would be seriously endangered."

BUT, at the rate of investment planned by American manufacturing industry for 1950, it would take 40 years to modernize thoroughly our present industrial plant and equipment. That would still leave undone the job of increasing it to meet the needs of an expanding economy of the kind sketched by President Truman in his message.

In attaining even this rate of investment, the McGraw-Hill survey shows American business must rely overwhelmingly on its own profits, which have declined as the country has left the postwar boom behind it. Most American companies cannot sell new common stock except at ruinously low prices. Here is one case where government action is really needed to help business and help to keep a rising American standard of living.

In order to get enough business investment to assure the "full recovery and continued expansion" sought by the President, our country needs:

1. Lower taxes on business income so as to release more money for new plant and equipment.

2. Liberalized depreciation allowances on old plant and tools so that business can buy new equipment faster.

3. Repeal of the present double taxation of dividends which now are taxed once as corporation income and again as personal income.

It is encouraging to have the President explicitly recognize the key importance of adequate business investment in providing steadily expanding prosperity. The next and most important thing to do is to make this recognition effective by discarding national policies which are blighting an adequate volume of business investment.

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DOUGLAS PUD ACQUIRES PROPERTIES FROM CHELAN

Chelan County (Wash.) PUD has sold to the Douglas County PUD of Waterville a part of the properties which it bought last year from Puget Sound Power & Light Co. The $1,090,000 sale is according to an agreement between George Hamilton, Douglas PUD president, and L. J. Richardson, Chelan president, before the purchase from Puget Power.

Included in the properties going to Douglas PUD are lines in the county and a small section of adjacent Grant County. Approximately 14% of the customers served by Chelan PUD and 11% of the Chelan district's gross revenue are affected.

Financing was arranged through a loan from the REA at 2% interest.

Commissioners of the two districts have agreed that the Chelan district will continue to operate the property in Douglas and Grant counties until about June 1. William T. Hordeen, former industrial consultant for the Chelan PUD, will represent the Douglas district as its resident manager in connection with the purchased properties and will maintain his office in the Chelan County office.

Power for the proportion sold will be furnished by the Chelan district under an 80-year contract at the prevailing Bonneville rate. Major portion of the sale proceeds will be used by the Chelan district to retire its revenue bonds and to build up reserves for bond retirement, said Richardson. The Chelan PUD paid $2,028,000 for the properties it purchased from Puget Power, plus additional amounts for accounts receivable and other items.

Chelan PUD commissioners said the sale will not affect the proceedings now pending to acquire distribution and generating properties of the Washington Water Power Co. in Chelan County. The state superior and supreme courts have granted the PUD an order of public use and necessity to acquire the properties, but the company has appealed the decision to the United States Supreme Court.

Shareholder Assessments Down in Salt River Valley

Shareholders' assessments in the Salt River Valley Water Users Assn. project in Central Arizona keep on the decline. A peak assessment of $10 an acre for water rights was made in 1948. This was cut back to $9 in 1949 and was set up as $7.50 for this year. Recent action has whittled another dollar, making this year's costs $6.50.

At the same time, the second cut within eight months was made in irrigation pump power rates. The demand, or service, charge has been eliminated and new rates are set at 9 mills per kwh. for the first 225 kwh. and 7 mills for all additional power.

Richard D. Searles, association president, said reinvestment of net income in the last two years in plants and improvements and expansion of service facilities made the reduction possible.

Will Make Rain with Silver Iodide Vapor

The Salt River Valley Water Users Assn. will use land-based silver iodide vapor units to produce rain on its Arizona watersheds. The decision was reached after 1949 experiments in which dry ice and silver iodide were dispensed from airplanes.

The association now owns three of the ground units and has ordered the construction of seven more. Vaporized silver iodide from one unit, under suitable atmospheric conditions, can effect rainfall over an area of 240 square miles.

It is reported that locating the units in the mountains in the watershed area will produce rain as efficiently as seeding by plane and at about one-tenth the cost.

During recent artificial precipitation experiments on the upper Verde, four times as much rain fell in the test area as outside the zone of effectiveness.

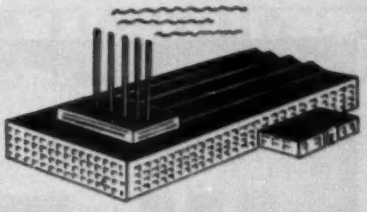
The mobile equipment now used for producing the silver iodide vapor is manually operated. However, refinement in the design is expected to produce a machine that can be operated electronically by remote control.

Clark County PUD Damage High from Silver Thaw

Damage to the electrical system of the Clark County PUD at Vancouver, Wash., by a silver thaw will be in excess of $500,000, according to reports from that area. Weight of ice on the lines snapped them in many places, particularly in rural areas. To make repairs, the PUD added 12 men to its permanent operating department of nearly 100 people and hired four contractors with 54 additional men.

● The Public Utilities Commission of Sitka, Alaska, has decided to request $1,500,000 under the Federal Community Facilities Act to construct a new power plant, as well as transmission and distribution lines.

Modernizing with ISOLATORS



A large industrial plant has just completed the modernization of their power distribution system. Only the most up-to-date equipment and methods were used. As regards the high voltage switching equipment it is only natural that the engineers* selected ISOLATORS. Upward to twenty-three pole ISOLATORS were used, some being of the disconnect and some of the interrupter type.

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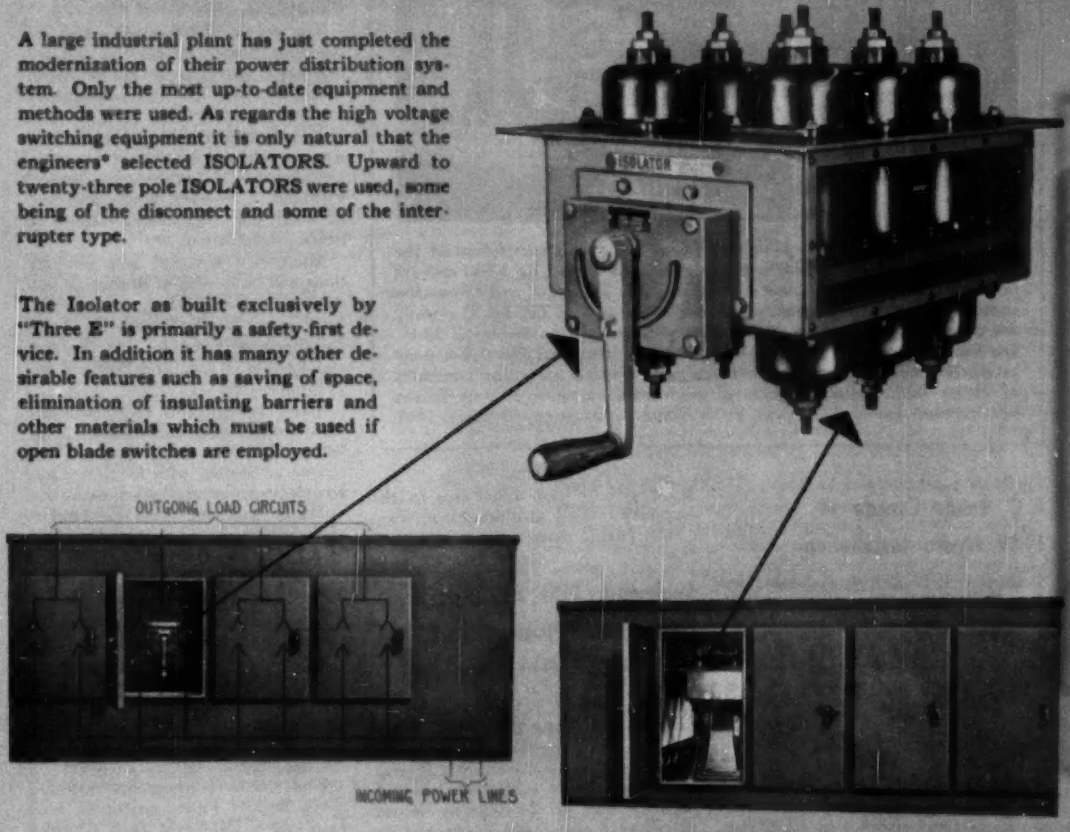

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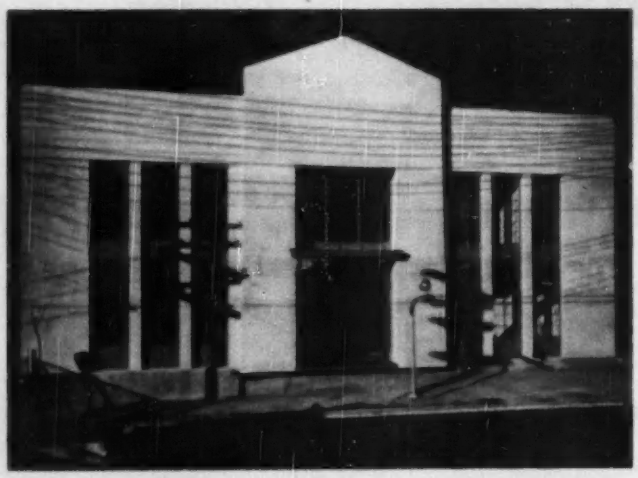


More power was made available in Yuma, Ariz., with completion of the Arizona Edison Co.'s $750,000 plant, which was visited by 3,500 persons on the opening day. The new installation adds 3,525 kw. and brings the company's generating capacity in the area to some 6,725 kw. Previously the power supply had been almost totally dependent on the USBR 33-kv. line from Parker Dam. The new plant gives stand-by and lowers company production costs, which reflected sharply increased rates for purchases of Parker Dam power in excess of contracted amounts. Arizona Edison has invested nearly $2 million in its Yuma system since January 1948

B.C. Leads Canada in 1949 Hydro Installation

During 1949 British Columbia led Canada in hydro electric power installations. During the year the province added 228,300 hp.—almost half the Canadian total of 479,000 hp.

The province now ranks third (behind Ontario and Quebec in that order) with just over a million horsepower capacity. Canada's total is 11,622,668.

The greatest single addition in Canada was at Bridge River where the B. C. Electric added two 62,000-hp. units bringing the total plant capacity to 186,000 hp.

B. C. Electric also installed a third unit of 17,000 hp. to its Ruskin plant at Stave Falls for operation in 1950.

On Vancouver Island, two 28,000-hp. units were added to the John Hart development and the Ladore Falls storage dam was completed.

On the Kootenay River, the Consolidated Mining & Smelting Co. added a third 37,000-hp. turbine in its Brilliant plant.

Smaller installations during the year included: 6,750 hp. in the city of Nelson plant on the Kootenay River; 3,650 by the B. C. Pulp & Paper Co. at Woodfibre and 1,200 hp. in the company's plant at Port Alice, Vancouver Island, replacing a 300-hp. unit.

Snohomish PUD Approves Construction Program

Commissioners of the Snohomish County PUD at Everett, Wash., have approved a $1,331,000 construction program to improve the PUD distribution system during the next five years.

Largest 1950 improvement will be at the South Everett substation, where a capacity load of 24,700 kva. is expected next winter and 27,500 kva. in the winter of 1952 and 1953. Cost of the work will be $100,000.

A copper line will be constructed from Arlington to Stanwood at a cost of $40,000, and a 3,000-kva. substation will be installed at Edmonds to relieve overload on the existing Martha Lake substation and provide 10,625-kva. capacity. Cost of the Edmonds work is estimated at $48,000.

Commissioners meanwhile denied reports that the proposed $14,000,000 Sultan River hydroelectric project had been abandoned. The Harza Engineering Co. now is preparing a design and cost estimate, they declared, with a report scheduled for April.

BPA LETS CONTRACT FOR MICROWAVE INSTALLATION

One of the largest microwave installations in the country will provide modern protective and operating devices for network transmission facilities over the Bonneville power system in the Pacific Northwest. A contract for the system equipment has been awarded by the Bonneville Power Administration to the Philco Corp. of Philadelphia on a bid of $633,492.

The system will link all major dispatching centers, substations and federal power plants in the Pacific Northwest with voice communication, relaying, telemetering and fault location channels. Construction of six microwave towers and substations for initial installation of equipment between Portland, Vancouver, Wash., and Seattle load and dispatching centers is nearing completion.

Microwave terminal and way stations will be located at Bonneville substations and dispatching centers near Vancouver, North Bonneville, Trinidad, Snohomish, Coulee City, Spokane and Vernita, Wash., and Portland and Troutdale, Ore.

Major power grids to be provided with microwave facilities include high-voltage facilities from Portland-Vancouver to Seattle, with loops to Chief Joseph and Grand Coulee dams and Spokane, and east from Portland to McNary Dam and eventually from Spokane to Hungry Horse Dam and from Portland to Eugene, Ore.

"Microwave radio is expected to effect substantial savings in maintenance and operating costs through instant detection of transmission faults before extensive damage results, and to greatly curtail serious system outages through detection and operating facilities," said Sol E. Schultz, Bonneville chief engineer.

Five electrical equipment manufacturers besides Philco submitted bids. They were: Motorola Inc., Chicago, $807,822; Federal Telecommunications Laboratories, Nutley, N. Y., $879,487; General Electric Co., Syracuse, N. Y., $953,959, and Sperry Corp., Great Neck, N. Y. FOB $2,033,478.

● Office Employees of the B. C. Electric Railway Co. will work henceforth on a 37½-hour, five-day week. A new contract has been negotiated with the Office Employees' Assn., which will run for two years, reducing the working hours by 2½ hours and providing a 10% increase in wages, which it is estimated will cost the company $300,000 annually.

how GOOD can PLANNED LIGHTING be without good equipment?

THE answer is—no better than a building plan without good building material. There is no dodging the fact that Good Equipment is the BASIC factor in a GOOD LIGHTING PLAN. It is the lighting units, the lampholders, the ballasts, the reflector, etc., which MAKE or BREAK the final results, in terms of sustained lighting efficiency, low-cost maintenance and dependable operation.

That's why, no matter how good the Lighting Plan, the results may be disappointing unless the plan includes GOOD EQUIPMENT.

the PUBLIC must be BETTER INFORMED on the importance of GOOD lighting equipment

As an industry, and as individual business men, we fail in selling PLANNED LIGHTING when we do not sell the importance of GOOD EQUIPMENT at the same time. It is our obligation that we keep faith with our customers by giving them the UNVARNISHED FACTS about the DIFFERENCE between GOOD and INFERIOR or SUBSTANDARD EQUIPMENT in terms of the factors listed below.

The buyer is entitled to KNOW these facts and to be TOLD and SHOWN that there are POSITIVE PROTECTIONS provided by the lighting industry, which assure him that the equipment he buys is in the GOOD EQUIPMENT BRACKET . . . the QUALITY BRACKET. *Proof of Quality* in lighting equipment is MADE EASY through such proof elements as:

CERTIFIED BALLAST LABEL

RLM LABEL

UNDERWRITERS' LABORATORIES LABEL

ELECTRICAL TESTING LABORATORY TESTS

These provide the buyer not only with the assurance that MINIMUM STANDARDS for performance have been met, but also that UNIFORM QUALITY is continuously maintained from one piece of equipment to the other.

FREE Booklet. . . The RLM Standards Institute has published a booklet containing the detail of each specification for each type of lighting unit for which RLM Standards have been established, as well as a complete summary of the IMPORTANCE OF THE LABEL in terms of CUSTOMER BENEFITS.

How the RLM Label provides assurance that the equipment is of uniformly high quality is shown through an outline of the RLM CONFORMANCE PROGRAM. Under this program, the Electrical Testing Laboratories make periodic tests of samples obtained from factory or market place to make sure that all equipment bearing the RLM Label consistently and continuously adheres to RLM Standards.

Make the RLM BOOKLET a part of every Planned LIGHTING PROPOSAL! . . . Write to the RLM Standards Institute for your COMPLIMENTARY COPY (or copies) of the RLM SPECIFICATION BOOKLET *today*. Plan to attach a copy to every PLANNED LIGHTING proposal you submit . . . let it help you point out to your customers that GOOD EQUIPMENT is BASIC to GOOD PLANNED LIGHTING.

the PUBLIC is entitled to KNOW these FACTS about GOOD LIGHTING EQUIPMENT

CONSTRUCTION: Good Lighting Equipment features structurally sound fabrication and heavy steels for maximum resistance to sag, distortion and breakage.

FINISH: Good Lighting Equipment features reflector finishes that insure your getting all the light you pay for . . . this year and ten years from now! That is why good equipment so overwhelmingly features PORCELAIN ENAMEL—the one and only commercially available finish that cannot deteriorate or corrode, regardless of the industrial atmosphere. Additional advantages of Porcelain Enamel are (1) that it is the only finish whose original efficiency can be sustained year after year by simply washing it with soap and water, and (2) that it is UNSURPASSED as a reflecting surface, because it ideally combines a high reflection factor with a high diffusion factor, insuring high light output with a minimum of glare.

REFLECTOR DESIGN: Good Lighting Equipment insures good lighting through reflector design that conforms to the most accepted principles of Illuminating Engineering. Such design protects the workers' eyes while delivering, not only the *most light* per dollar, but also the *required quality of light* for the individual Seeing Task.

SOCKETS, STARTERS, LAMPHOLDERS: Good Lighting Equipment features ruggedly constructed parts that withstand years of use and embody special design which facilitates quick, money-saving maintenance and low-cost operation.

BALLASTS: Good Lighting Equipment insures you against trouble by employing only the highest quality certified ballasts. Ballasts last longer because sound electrical and mechanical design prevents high temperature ballast operations. Lamps last longer because certified ballasts supply proper starting current and maintain proper operating watts to the lamp. Present wiring capacity is used most efficiently by the high power factor of quality ballasts.

This Advertisement is published in the interest of the Entire Lighting Industry by

RLM STANDARDS INSTITUTE
INCORPORATED

The Industry Authority for Reflector and Lighting Equipment Manufacturers

RLM STANDARDS INSTITUTE, SUITE 823, 326 W. MADISON ST., CHICAGO 6, ILL.

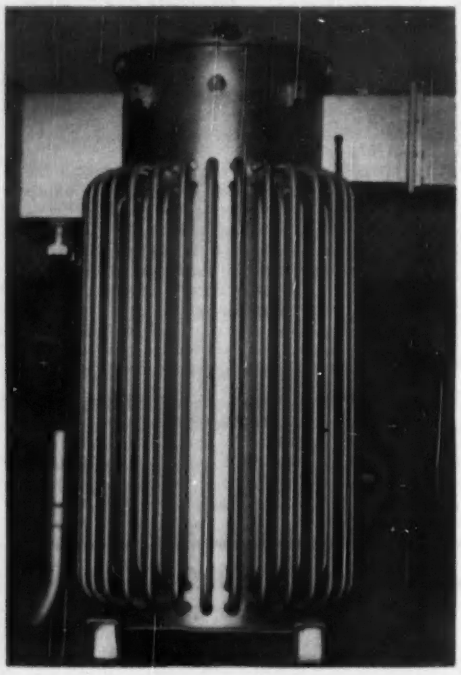
NEW POWER STATION OPENED AT TUCSON

More than 16,000 persons attended the four-day open house celebrating completion of the Tucson Gas, Electric Light & Power Co.'s new DeMoss-Petrie power station at Tucson, according to J. R. Snider, company president.

The $4 million plant contains two Westinghouse steam turbines, one rated at 12,500 kw., the other 11,500 kw. It brings the company's generating facilities in the area to 44,000 kw.

Visitors to the open house received an attractive two-color booklet, telling about the company, the new plant, electricity, and possibilities for the future.

● California Electric Power Co. will construct a business office building in San Bernardino. The property was rezoned for the building by the San Bernardino city planning commission and final approval was given by the city council. The building, which will have an adjoining parking lot for patrons, is expected to be ready for occupancy by the end of the year.



Three phase transformer, 1000 KVA, 12000 volts to 480 volts, part of a Gardner installation at W. P. Fuller Company, South San Francisco.

Safe handling of voltages necessary to operate industrial power units is provided by Gardner step-down transformers installed on manufacturer's premises. Transmission losses are held to a minimum while efficient transformer operation is assured by the high standards of engineering and construction maintained by Gardner Electric.

Gardner Electric Mfg. Co.
EMERYVILLE 8 CALIFORNIA

Representatives
WEST COAST
MAYDWELL & HARTZELL, INC.
MOUNTAIN STATES
ELECTRICAL SPECIALTY CO.

GARDNER TRANSFORMERS GUARD PROFITS

CONTRACT SIGNED FOR HOOVER DAM POWER

A contract has been signed between the Nevada Colorado River Commission and the Harvey Machine Co., Torrance, Calif., guaranteeing 300,000,000 kwh. of firm power annually from Hoover Dam for an aluminum reduction plant near Henderson, Nev.

Also involved is the sale of 200 acres of desert land near the wartime Basic Magnesium plant.

Harvey will build a carbon electrode manufacturing plant, a rolling mill, and aluminum reduction plant on the site.

Plans have now been drawn and work will begin within 90 days at the plant site, with production expected within 19 months. The minimum guarantee of 300,000,000 kwh. of Hoover Dam power assures an annual production of 36,000,000 lb. of aluminum from one pot line. The company, however, hopes to get 600,000,000 kwh, annually of surplus power — which could mean a 105,000,000 lb. aluminum output.

Bauxite will be bought from Arkansas and Dutch and British Guiana and processed into alumina in an Alabama plant, to be set up as a joint venture by Harvey. From there, alumina will be shipped by rail to Nevada.

Power Going to Victoria From John Hart Plant

Power from the John Hart development at Campbell River, B. C., is being sent to the city of Victoria and to a cement plant at Bamberton near Victoria. This is the first time that power from the B. C. Power Commission development has been supplied to customers in B. C. Electric territory.

Energy from the plant is carried from Campbell River to Nanaimo over 132-kv. lines, then transferred to a 60-kv. line used when power from the B. C. Electric area was "exported" to Nanaimo and northern island points. By next fall a 132-kv. line will be completed into Victoria.

When the full Campbell River development is completed, B. C. electric will be buying about 23,000 hp. totaling some $46,000 annually. The power commission's rate of approximately $20 per horsepower to B. C. Electric is shaved to about $18 on power supplied to pulp plants at Alberni and Nanaimo. These two plants, with B. C. Electric area in the south of Vancouver Island, will be using about three-quarters of a million dollars worth of power from Campbell River annually in the near future, it is estimated.

AFL WINS IN PG AND E BARGAINING ELECTION

AFL won over CIO by a margin of better than 2½ to 1 in the recent NLRB bargaining election to decide which would represent Pacific Gas and Electric Co. workers.

Nearly 9,900 of the 12,200 eligible voters in the two unions, the AFL International Brotherhood of Electrical Workers and the CIO Utility Workers' Union, cast ballots in the election. NLRB officials termed the turnout "above average."

O. G. Harbak, AFL International vice-president, receiving word of the election results, said his union would take steps to organize the members of the CIO locals, obtain an agreement with PG and E covering the new group and seek inclusion in contracts of union security clauses setting up a union shop.

FPC Publishes New State Maps of Electric Systems

The Federal Power Commission has announced publication of three new state maps of electric facilities for Arizona, Colorado and Wyoming. These maps, reproduced in several colors on a scale of 20 miles to the inch, are each approximately 21x28 in.

They show the location, capacity and ownership of the important generating stations, both hydroelectric and fuel-electric, as well as the location, ownership, nominal voltage, length, conductor size and material, and capacity of high-voltage lines of 22,000 volts or more. Both existing facilities and those under construction are included.

Copies may be purchased from the Publications Section, Federal Power Commission, Washington 25, D. C., for $1.00 each. The order numbers are FPC-M-12 for the Arizona map, FPC-M-13 for the Colorado map and FPC-M-14 for the Wyoming map.

● EMPLOYEES of the Snohomish County PUD at Everett, Wash., returned to work after the PUD commission agreed to meet its demand of a 10-cent hourly wage increase. (EWEST, February, p. 124.) They attended all-day meetings for several days until the commission surrendered.

● SAN DIEGO Gas & Electric Co. will soon offer 500,000 shares of $10 par value common stock, without competitive bidding, to retire short-term bank loans and also to help finance its $12,000,000 expansion program.

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ELECTRIC MFG. CO. CHICAGO, U.S.A.
THE GREATEST NAME IN LIGHTING
OFFERS FEATURE UNITS THAT BUILD VOLUME

CODE BEACONS

CAA SPEC. 446

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CALL ON THESE WEST COAST REPRESENTATIVES
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HUGH SHEETER
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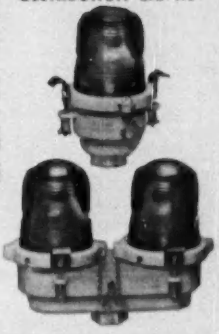
OBSTRUCTION LIGHTS



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Insulated Conduit-

Remember when Insulated Bushings were a luxury because they cost so much. That was before UNION entered the field.

Using knowledge gained during the War, on November 1, 1947 UNION introduced the first molded Insulated Bushings. These molded bushings offered economies hitherto unknown.

UNION'S Bushings have a smooth insulated lip that makes wire pulling easy. They will not damage the softest wire insulation. No sharp metallic edges can cut into the wire causing hard-to-locate "grounds".

There is so little difference in the over-all cost of wiring between UNION'S Insulated Bushings and metallic bushings that you cannot afford to risk future trouble from costly "grounds and shorts". It is wise to specify UNION Insulated Bushings throughout as so many are now doing. UNION makes the best.

In sizes 1¼" and up where strength counts, be sure you "see the canvas". Then you know that no substitution of a weaker material can be made.

Bushings

UNION INSULATING CO.
PARKERSBURG, WEST VIRGINIA

NEWS ABOUT PEOPLE

● PUGET SOUND POWER & LIGHT Co. has announced personnel changes: CHARLES F. TERRELL, vice-president of the utility, has accepted the newly created position of executive director for Nebraska Public Power System. Terrell started his career in the utility business in the operating department of Puget Sound Power & Light and in 1923 became superintendent for the company's properties in its northern division at Bellingham. In 1925 he went to El Paso Electric Co. as general superintendent of the light and power department and was later employed in a similar capacity for Tampa Electric Co. From 1928 to 1940 he was operating manager for Gulf States Utilities Co. He returned to Puget Power in Seattle as operating manager in 1940 and two years later was elevated to vice-president in charge of operations.

● A. L. POLLARD, formerly general superintendent of operations for Puget Power, has become operating manager for the company. Starting his career in 1915, he came to Puget Power in 1930 as superintendent of the company's steam division and in 1932 was made assistant general superintendent of light and power for the central division in Seattle. He became general superintendent of light and power, steam heat and steam generation in 1935 and the following year was made general superintendent of light and power for the entire company. He has held the position of general superintendent of operations since 1945.

● HENRY R. KRUSE, general commercial manager for Puget Sound Power & Light, has assumed duties as manager of the company's southern division at Olympia, succeeding Frank Walsh, who died recently. He started with the utility in 1923 in a sales capacity and has served in all of the company's divisions and in the general offices in Seattle. He became sales manager of the eastern division at Wenatchee in 1930, later moving to the northeastern division at Everett in a similar capacity. In 1937 he was made company sales promotion manager. He was elevated to northern division manager at Bellingham in 1942, brought back to Seattle a year later to head the economic development and research department, and in 1945 was promoted to general sales manager. He became general commercial manager for the utility in 1947.

Kruse Pollard

● C. JACK JONES of Kitsap County, Bremerton, was elected president of the Puget Sound Utilities Commissioners' Assn. at its annual meeting in Seattle recently. He replaces MAX SCHMUCK of Clallam County. Harvey Benson of Skagit County was elected vice-president and E. B. Stookey of Thurston County was re-elected secretary-treasurer. The association comprises the public utility districts planning a joint purchase of Puget Sound Power & Light Co. properties. The association reaffirmed its previous support for the CVA.

● H. C. GALITZ of Burlingame, Calif., has been named Westinghouse elevator division manager for the Los Angeles area, according to R. H. Wagner, Pacific Coast district manager for the division. Galitz, who was formerly in charge of new sales activities in the San Francisco area, will take over his new assignment with headquarters at the Los Angeles office, replacing GANO R. BAKER, who has been transferred to the division's headquarters in New York City as sales manager for the eastern district.

● LLOYD T. CRAMER was appointed Westinghouse elevator division salesman with headquarters at the San Francisco office. He was previously service manager for the elevator division in the eastern district. He will be in charge of new sales activities for the division in the northern California and Pacific Northwest areas.

● ROBERT OLIN has taken over the duties of field merchandiser in charge of the Western division of Admiral Corp., with headquarters in San Francisco. Olin was formerly Chicago district manager of the toastmaster division of McGraw Electric Co.

● BEN ROGERS, past president of the Bureau of Radio & Electrical Appliances of San Diego County, has joined the Ray Thomas Co., replacing E. S. CHESNESS, who has been called to the home office for permanent duty.

● MAX A. HINRICHS, well-known on the West Coast and Hawaiian Islands for his work as electrical engineer on marine and power installations, retired recently from General Electric Co., after 43 years of service. He joined the San Francisco office of G-E's apparatus department in 1911. For developing a new supporting and centering arrangement for turbine diaphragms, he was awarded the company's highest honor, the Coffin Award, in 1941. Most recently he has been engaged in installation work of hydro-generators at Keswick Dam and other special assignments.

● BEN D. MOSES, recently awarded a plaque by the Pacific Coast Electrical Assn. in recognition of his 25 years as executive secretary of the California Committee on the Relationship of Electricity to Agriculture and for his contribution to the advancement of farm electrification in California, announces that he will retire next June as professor of agricultural engineering at the College of Agriculture, University of California, Davis. He has served more than 25 years with the college.

● M. D. SCHUSTER, formerly general manager of Hoffman Sales Corp., Los Angeles, has been appointed district sales manager for the Magnavox Co. in the Los Angeles area.

● FRANK E. BODINE has become assistant central station manager for Westinghouse Electric's Pacific Coast district, with headquarters in San Francisco. Formerly Pacific Coast manager of maintenance sales, Bodine will serve the company's utility customers throughout the district in his new position.

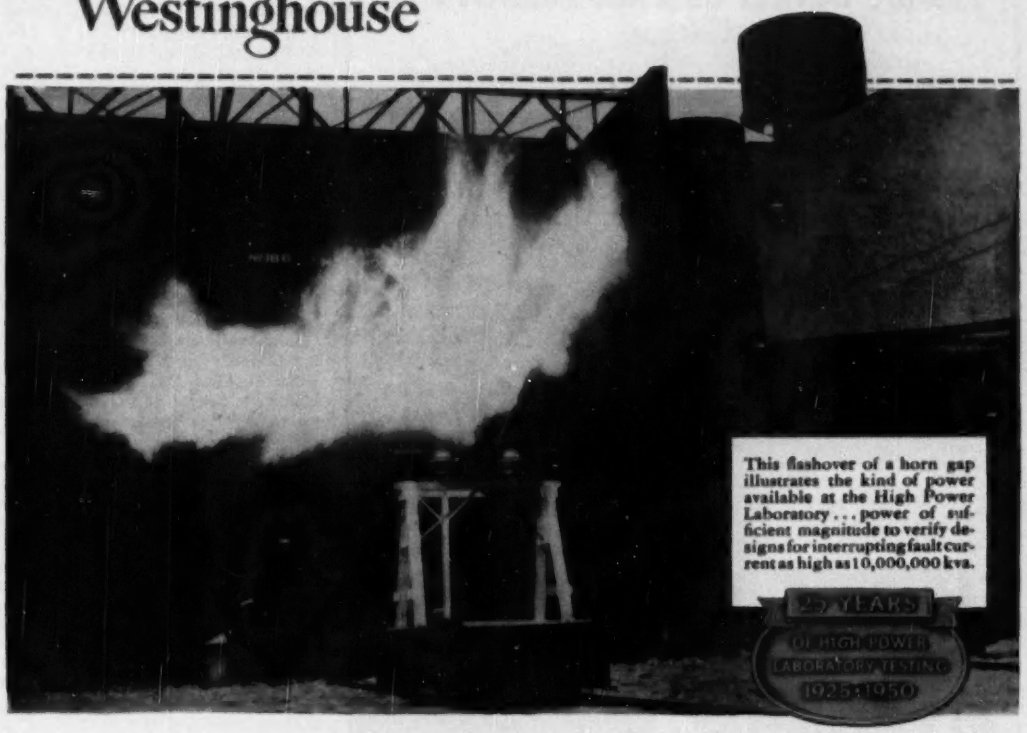
● C. D. OLDS succeeds A. C. RIGGS as superintendent of light and power for the northern division of Puget Sound Power & Light Co. at Bellingham, Wash. Olds had been assistant superintendent of light and power for the division since 1930. Riggs retired after 44 years with the company.

● F. W. BEICHLEY of San Francisco has assumed the position of Pacific Coast district engineering supervisor for Westinghouse, headquartering in San Francisco. He was formerly transportation engineering supervisor.

● LOWELL CHASE has been transferred from the Eugene, Ore., office of the Graybar Electric Co. to Seattle to assume new duties as manager, appliance promotion. He will work under the direction of John P. Lawton, district manager of Graybar.

YOU CAN BE **SURE**.. IF IT'S

Westinghouse



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Here's *SURENESS*... in the Making!

Sureness doesn't spring from skillful engineering and quality manufacturing alone. It takes testing, too . . . rigid design testing on a scale equaling the severest kind of service conditions. Fault currents of tremendous magnitude, sub-zero weather, severe icing conditions, searing flashovers . . . these are only a few of the tests given every new Westinghouse design.

This business of making *sure* . . . of anticipating and duplicating every conceivable service condition, is the work of the Westinghouse High Power Laboratory . . . for 25 years the proving ground for all Westinghouse electrical apparatus. This is where we make *sure* . . . and this sureness is passed along to you. It backs up every Westinghouse label, whether it appears on a tiny switch, a giant circuit breaker or the world's largest lightning arrester. J-40697

SEE FOR YOURSELF!

Booklet B-4383 describes facilities, procedures and actual tests conducted at the Westinghouse High Power Laboratory. Ask your Westinghouse representative for a copy of B-4383, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

Westinghouse

HIGH-POWER
LABORATORY

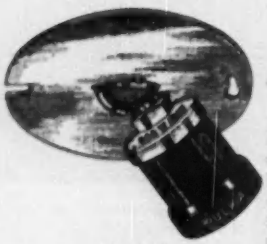
Feature Devices from the KULKA Line

ADJUSTABLE SWIVEL SOCKETS
IN BAKELITE AND PORCELAIN

Screw type—with no exposed connecting wires. Screws into any standard outlet. Swivel is of special die-cast material of high tensile strength and long wearing qualities. Wire leads cannot cross or twist. Maximum flexibility in any direction.

Listed by UL and CSA

No. 160
HALF SIZE



No. 161
HALF SIZE

MOUNTED ADJUSTABLE SOCKET ON ALUMINUM OUTLET BOX COVER
IN BAKELITE AND PORCELAIN

For permanent wiring. Comes with soldered leads or terminals. Has same well-built swivel unit as No. 160 above. Box cover is satin finished aluminum and comes in 3¼" and 4" sizes. A very attractive unit.

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Practically all your small transformer needs are supplied by the Complete Jeffries line. We have specialized for years in providing transformer to exactly match your requirements. If not in our regular line, we build to meet your specifications in a hurry!

Minimize your voltage losses. Specify scattered transformers to eliminate duplicate conduit runs, and save on power costs.

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AUTOMATIC CONTROLS FOR INDUSTRIAL APPLICATIONS REQUIRING POSITIVE CONTROL OF PRESSURE, TEMPERATURE, LIQUID LEVEL, ETC.

SIMPLE TO ADJUST FOR THE SPECIFIED OPERATING RANGE

MERCOID CONTROLS ARE EQUIPPED WITH MERCURY SWITCHES, THEREBY INSURING GREATER SAFETY, BETTER PERFORMANCE AND LONGER CONTROL LIFE

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● WILKES F. LAMBIRTH has been advanced to assistant to D. B. Wheelock, general commercial manager of California Electric Power Co. Lambirth started with the company as groundman in the Coachella Valley in 1937, later became service foreman and then district manager in Bishop in 1945. Two years later he was moved to Victorville. Last year he became commercial agent, the position he held until his recent appointment.

● FRANK C. PORTER was recently made vice-president and general manager for the F. B. Connelly Co., Portland, Ore. He formerly held the same position for the company in Seattle. H. T. WARD, former sales manager for Harold Kelly Appliance Center, has become major appliance sales manager for Connelly in Portland. ELDON N. DEAN of Flint Distributing Co., Salt Lake City, has joined Connelly as sales manager in the Seattle office.

● RICHARD TUPPER has resigned from the Thor Corp., El Monte, Calif., to enter the retail television field with a store at 8200 Long Beach Blvd., Southgate. He had been associated with Thor for about five years as southern California branch manager. JOHN GUNDERSON, Western divisional manager for Thor, will absorb the duties of branch manager.

● LEO HAHN has become manager of the premium sales division of Emerson Radio & Phonograph Corp. He returns to Emerson Radio after serving two years as manager of the Emerson Radio distributing organization for northern California.

● WILLIAM REASONER, formerly sales manager with D. E. Lindsay Co., Seattle distributor for Bendix, has joined the Crosley division, Avco Mfg. Corp., as regional representative for radio and television for the Western States.

● FRANK W. HEVESY has been added to the exploitation staff of Hoffman Radio Corp., Los Angeles. He was formerly advertising manager of Milliron's, Los Angeles department store.

● R. W. MAGEE is now associated with Distributors Inc., San Diego. He has been in appliance distribution in San Diego for more than a year.

● TED O. GERLISCHE, consulting electrical engineer, has moved his offices from San Lorenzo to 3144 Middleton St., Oakland 5.

● FRANK WITHERS, formerly with Hall & Nunn, has joined the staff of Kingsway Refrigeration Co., Vancouver, B. C.

● T. H. DOHERTY is the new lighting sales engineer for B. C. Electric Railway Co. at Vancouver. Formerly industrial power sales representative for the company, Doherty succeeds EARL S. JARVIS, who has become secretary of the Electrical Service League for the northern Vancouver Island division.

● WILLIAM F. U'REN has resigned from Columbia Steel Co. to accept a position as sales engineer for Columbia Steel Casting Co., Portland. He will operate in California and Nevada.

● ROBERT F. CLARK Co., Denver, has become regional distributor for Coolerator Co.

Deaths

● FRANK WALSH, 62, manager of Puget Sound Power & Light Co.'s southern division, died in Olympia, Wash., recently after a brief illness. During his 38 years with the company Mr. Walsh served in an executive capacity in almost all the utility's properties. He was first employed by Puget Power in the operational phase of the company in Bellingham. He later became superintendent of light and power in the eastern district at Wenatchee and subsequently held the same position in the northeastern division at Everett. He was elevated to the managerial post in Everett in 1929, became manager of the northern division at Bellingham in 1936. He was transferred to the central division at Seattle in the same capacity in 1941 and in 1947 transferred again to the southern division as manager, the position he held until his sudden death. Mr. Walsh was a member of the American Institute of Electrical Engineers, Northwest Electric Light & Power Assn., Electric Club of Washington and Chamber of Commerce.

● WORD received from Pelham, N. Y., early in February reported the death of Richard Boykin, manager of the Puget Sound Light & Power Company in Seattle a quarter of a century ago. Mr. Boykin, a Virginian, went to the Puget Sound Power & Light Co. from Portland, where he had managed a utility company. He left Puget Power to join the Electric Bond & Share Co.

● GEORGE D. SMITH, electrical contractor in San Francisco since he arrived there after the 1906 fire, died Feb. 16. He was a life-long member of the San Francisco Electrical Contractors Assn. and recently was re-elected its treasurer, an office he held many times.

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Engineers of a large utility recently made their own strength test of competitive Split Bolt Connectors. These impartial tests proved that Sherman Split Bolt Connectors were the strongest of all!

The Engineering and purchasing Departments compared notes. Result: A substantial order for Sherman Split Bolt Connectors.

Sherman offers the best combination of Quality *plus* Price!

Write for Bulletin No. 22 today.

H. B. *Sherman* Mfg. Co.
BATTLE CREEK, MICHIGAN

ALL the strength and durability inherent in steel are combined—with definite economies—in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

Ask the distributor of *Crapo* Galvanized Products near you or write direct for further information

INDIANA STEEL & WIRE CO.
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Fred Reports

Dear Len:

Reception of the Williams Digger has been very good here in the Pacific area. We've made a lot of friends and shown them what a rugged machine will do. The ability of the digger to sink a nine foot hole in a minute really stops them. p.s. Put the coupon in our ad here so some of the folks I demonstrated can write for ordering, and price information.

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Speed up the feeding of cable from the reel into the conduit. The heavy flexible tubing prevents injury to the cable and the large mouth facilitates the application of pulling compound.

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DIRECTORY OF WESTERN REPRESENTATIVES

Keep these Directories for reference throughout the year.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

NOTES ON THE TRADE

● Scott-Buttner Electric Co. of Oakland has announced the purchase from Ken Ryals of the firm Ryals Electric Co. and will open a contracting and service facility in San Francisco at 474 Natoma St. Loren Nutter, graduate electrical engineer, has been placed in charge of the San Francisco branch. Combined facilities of the Oakland plant and shop at 896 West Grand Ave. for construction, maintenance and repair and motor rewind service are added to those of Ryals Electric Co. in San Francisco.

● Pacific Electric Motor Co. has announced a change in ownership and management. Frank E. Boyd, for the past 20 years half owner of it, has purchased the outstanding stock of the late Walter Vance. New officers of the corporation, under the sole ownership of Boyd, are: Frank E. Boyd, president; Josephine C. Boyd, vice-president; Mira Holland, for 15 years chief accountant, secretary - treasurer. Department heads are William E. Boyd, manager of sales and engineering; William J. Larsen, shop superintendent; Charles L. Elvin, construction superintendent; H. V. McLaughlin, purchasing, credits and collections. The company only recently built new plant facilities at 1009 66th Ave., Oakland.

● John B. McDonough, for many years with General Electric Co. industrial department, San Francisco, entered partnership with J. D. Power, president, and has become vice-president and treasurer of West Coast Electric Works Ltd., well known equipment and motor house at 166 7th street, San Francisco, originally owned by the late William Cann and Frank Cole. McDonough served five years in the Navy as a reserve officer, returning to G-E after the war. He has said the firm will specialize in heavy machinery and may go into manufacture of switchgear.

● Joseph Markel, president of La Salle Lighting Products Inc., of Buffalo, recently named "first citizen of Buffalo," has been on a tour of the West. In Seattle he appointed Bert Heinz, La Salle manufacturer's agent there, as agent also for the company's three-speed "Playmaster" record players. Other Markel products include electric heaters and lighting fixtures.

● HAROLD E. FARRIS, former general manager of Stubb's Electric Co. of Portland, has been named manager of field sales of American Kitchens, according to F. F. Duggan, general sales manager of the American Central Division of Avco Mfg. Corp. He will make his headquarters in Connersville, Ind. Before his association with Stubb's Electric Farris was manager of new business, advertising and the sales department of Mountain States Power Co.

● CONSTRUCTION has been started on a new $275,000 warehouse at Emeryville, Calif., for General Electric Supply Corp., which will more than triple the corporation's present warehouse facilities in the Oakland area. Providing 71,000 sq. ft. of floor space, the structure will be built on a 104,000-sq. ft. tract at 53rd and Hollis St.

● W. H. TANGEMAN, works manager of General Electric Co.'s flatiron plant at Ontario, Calif., has announced approval of plans for a $100,000 building addition to house an aluminum foundry and give additional space to plastic and punch press operations.

● WHIRLPOOL DIVISION, Nineteen Hundred Corp., has added the following West Coast distributors for its line of home laundry equipment: STREVELL-PATERSON HARDWARE CO., Salt Lake City; WESTERN APPLIANCE Corp., Denver; PRUDENTIAL DISTRIBUTORS Inc., Spokane.

● MERCURY TELEVISION Corp., Los Angeles, plans to enter the San Francisco and Bay Area, according to its president, Joe Benaron, who announced that the first step in promoting Mercury television in northern California has been the purchase of a television program on KGO-TV.

● THOMPSON & HOLMES Ltd., San Francisco and Sacramento, has taken on distribution of the Universal refrigeration line for northern California.

● TURNQUIST BROS. Co., Los Angeles, has been named distributor for the television and radio receivers made by John Meck Industries.

● ELECTRIC STEAM RADIATOR Corp., Paris, Ky., has appointed GLADSTONE, WILLIAMS & Associates, Los Angeles, as factory representatives in the Los Angeles and southern California area.

● TUBBS ELECTRIC Co. of Spokane now handles distribution of Deepfreeze home freezers in several Washington and Idaho counties.

Weatherproof
Sockets
ONLY UNION
offers a complete
WEATHERPROOF SOCKET LINE
For - Heavy Duty - - - - #63310 Canvas
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When in need of a sturdy dependable Weatherproof Socket come to PIGTAIL SOCKET HEADQUARTERS — UICo.
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Combination Slot Insulation
Commutators
Copper Lugs and Connectors
Cotton Tapes, Webbings, Sleevings
Decorative Bar Top Sheets
Duro and Insulating Papers
Ebony Asbestos
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Fiberglas Products
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Friction and Rubber Tapes
Fuses
Knife Switches and Parts
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2406 First Ave. South
ELliot 8061

DENVER 2
1915 Twenty-first St.
MAin 4912

SAN FRANCISCO 3
316 Eleventh Street
HEmlock 1-5116

TRANSERT
Brushes give
LONGER LIFE
EVEN AT LOW HUMIDITY

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The transverse graphite insert—exclusive with Helwig-Speer Transert Brushes — provides even current distribution, better ring lubrication. That means reduced ring wear, more uniform frictional characteristics for your rotating machines. Wedge- and force-fitted, the inserts cannot fall out. Catalog 95 contains complete information on ordering brushes. Write for your copy today.

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Seattle . . . . . 166 Jackson St.; Elliot 7133
Portland . . . . . 711 NW Everett St.; Beacon 3368
Los Angeles . . . . . 611 W. Pico Blvd.; Prospect 8381
Denver . . . . . 1644 Blake St.; Cherry 4425
Salt Lake City . . . . . 524 F. St.; Tel: 3-1600

HELWIG CO., Carbon Products
Makers of Multiflex and Transert Brushes

● AN ARVIN field force to work exclusively in electrical housewares sales and promotion has been announced by Gordon T. Ritter, director of sales for this division of Noblitt-Sparks Industries Inc. THEMIO PLAKOS, who was in charge of Oregon, Washington and Idaho on Arvin's complete line, will now travel those three states on electrical housewares only and will be additionally responsible for Montana, Utah and Wyoming. JAMES C. HOFER will devote himself to Arvin radio and television representation on the West Coast. EARLE ROGERS, Arvin field man, will now travel Arizona as well as Nevada and California.

● C. L. STOCKER has assumed sales and engineering responsibilities for Lincoln Electric Co. in the San Francisco area. Offices for this district are located at 1303 Stanford Ave., Emeryville, Calif. Stocker has been district manager of the Seattle area since 1943 and will be replaced there by A. L. PATNIK. The welding engineering staff at Emeryville was recently increased by the addition of M. F. YALE and T. NICHOL, both recent engineering graduates.

● FAIRBANKS, MORSE & Co., Chicago manufacturer, has announced that J. C. ELMBURG, who has for the past three years been manager of the Atlanta branch, has been transferred to Portland, Ore., where he has assumed the duties of branch manager, succeeding HOWARD OXSEN. Oxsen is returning to San Francisco to become manager of diesel engine sales in that area. A. M. MCLAREN was recently appointed manager of the firm's Los Angeles branch.

● WALTER J. TRUEMAN, manager of Kelowna branch of Hume & Rumble Ltd., has been transferred to the Edmonton office of the company to take charge of sales and public relations. He is succeeded by GEORGE W. FIRTH, who has been superintendent of the branch for the past 18 months.

● HOFFMAN RADIO CORP., Los Angeles, has bought the Hoffman Sales Corp., distributing agency in Los Angeles and San Francisco for the firm's products.

● COLUMBIA DISTRIBUTING Corp., Seattle, has been named distributor for Admiral products for the entire western Washington territory.

● KARL LERTZMAN, Hollywood, has been named electrical wholesaling representative for General Lighting Co., for the southern California area.

● RICKETTS-SEWELL ELECTRIC Ltd., Vancouver, B. C., has been awarded the subcontract for electrical installation in the new $255,000 Junior High School being erected in North Burnaby, B. C.

● A. E. SMITH and L. O. B. LINDSTROM, electrical and mechanical engineers, announce that GEORGE R. DUNCAN has joined their organization, which will now be known as Smith, Lindstrom & Duncan Inc. Their new address is 16 Toland St., San Francisco. For the past 24 years Duncan has been associated with Pacific Electric Motor Co. at Oakland.

● KINGSWAY ELECTRIC Ltd., Vancouver, B. C., has received the subcontract for electrical installation in the Sir James Douglas School's $363,617 addition in Vancouver.

● VICTORIA MARINE ELECTRIC ENGINEERING Co. Ltd., Victoria, has received the subcontract for the electrical installation in the building under construction in Victoria for the B. C. Power Commission.

● H. F. SWENSON has started the firm of Sweden Freezer Mfg. Co. of Canada Ltd., at 1055 Vernon Drive, Vancouver, B. C.

● ABOUT March 15, Advance Electric & Relay Co. will move from its present Los Angeles quarters to a new $85,000 plant at 2435 Naomi St., Burbank. The building will comprise 15,200 sq. ft.

● MARATHON ELECTRIC MFG. Corp. of Wausau, Wis., has opened an office in Seattle, with H. S. Emanuels as Northwest district manager.

● GILFILLAN BROS. Inc., Los Angeles, has received an additional $8,000,000 contract for GCA radar landing equipment. The contract, awarded by the U. S. Air Force, increased the company's backlog to $25,000,000.

● MOE BROS. MFG. Co. has changed its corporate name to Moe Light Inc., as a result of the company's tie-in with its brand name, Moe Light, for residential and commercial lighting fixtures.

● HILD ELECTRIC & MFG. Co., Stockton, Calif., and NORTHWEST CHAIN & SPROCKETS Inc., Portland, Ore., are newly appointed dealers for Allis-Chalmers general machinery division.

● THE IRONER DIVISION of Speed Queen Corp. has appointed Leo J. Meyberg Co. Inc., San Francisco and Los Angeles, as its distributor in those areas.

● SEATTLE RADIO SUPPLY Inc., Seattle, has taken on distribution for the Capehart line in western Washington.

● W. H. CONNOR of Denver has become a sales representative for Clarostat Mfg. Co. Inc., manufacturers of resistors, controls and resistance devices. With headquarters in Denver, his territory will include Wyoming, Utah, Colorado and New Mexico. The company's newly appointed sales representative in the Northwest area is SAM STROUM of Seattle, covering Washington, Oregon, Idaho and Montana. Stroum also was recently appointed sales representative in the Northwestern states for Insuline Corp. of America, manufacturers of radio parts.

● KAISER ALUMINUM & Chemical Sales Inc., Oakland, announces the transfer of several of its product sales offices to eastern locations. The firm's aluminum sheet and building products sales offices are being established at Chicago. Product offices have been set up at its Newark, Ohio, plant. Sales headquarters of the foil division are located at Permanente, Calif.

● VARIAN ASSOCIATES, San Carlos, Calif., has appointed B. C. GARDNER as an engineering staff member. Gardner was employed with Raytheon Mfg. Co. from 1942 until 1949 as engineering department head in charge of klystron development activities. He will continue in klystron development work with Varian.

● WILLIAM R. H. EBY has taken over the newly created position of industrial sales manager of the Pacific district of York Corp. He will headquarter in Los Angeles. Until recently Eby served as York's branch manager at Seattle.

● DALCO APPLIANCE Co., San Francisco, has appointed JOHN LUKANISH as sales manager of its Philco division. Dalco at the same time appointed JOHN E. KELLY as its advertising and promotion manager.

● APPLIANCE MFG. Co., Alliance, Ohio, has appointed BOYD ROBERTSON, Seattle, as a representative for its line of Duchess washers. Robertson will cover Washington and Oregon.

● GRAYBAR ELECTRIC Co. has completed its new Los Angeles distribution center, combining office and warehouse facilities. HARRY L. HARPER is district manager.

● ADVANCE ELECTRIC & RELAY Co., Burbank, Calif., has moved to a new building at 2435 N. Naomi St.

● R. D. SHORTRIDGE and F. HANHAM have formed the business of Burner Electric Service at Vancouver, B. C.

CHECK MOLONEY HiperCore* TRANSFORMERS

against the field for Lighter Weight, Smaller Size, Operating Advantages

CHECK THESE WEIGHTS

3 Kva CL-1 HiperCore Transformer including oil . . . . . 125 lbs.
3 Kva CL-2 HiperCore Transformer including oil . . . . . 130 lbs.
3 Kva CSP Class A HiperCore Transformer including oil . . . . 155 lbs.

Easier to install—easier to store—less maintenance

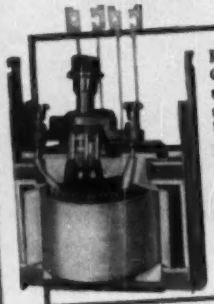
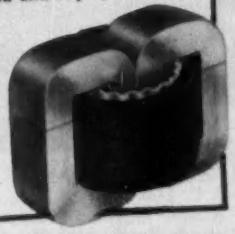
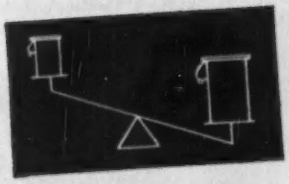


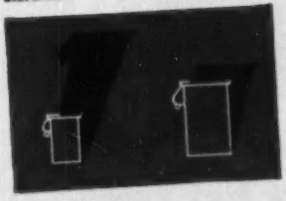
Illustration shows core-and-coil assembly. Cores are wound, annealed and impregnated, then cut into pairs of U-shaped pieces. Matching U-shaped pieces are then placed in position around the coil to complete the magnetic circuit. Core faces are cemented together. Steel bands are used to obtain tight joints.



15% TO 30% LIGHTER

because the cold rolled high permeability, oriented silicon core steel has 30% to 35% higher flux carrying capacity. This makes possible the use of smaller cores and windings. Easier to handle and install than transformers having cores of hot rolled steel, these smaller and lighter transformers take up less space on the pole, in the substation and on the line truck.



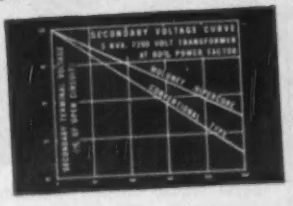


GREATER SHORT-TIME OVERLOAD CAPACITY

Moloney HiperCore Transformers have improved short-time overload characteristics which provide better peak load performance and longer life. Reduced coil mass, achieved through use of oriented steel cores, together with the extensive use of cooling ducts, results in more rapid cooling of the windings and in a lower hottest-spot temperature gradient.

BETTER VOLTAGE REGULATION

The smaller cores of HiperCore Transformers make possible windings having lower impedance. Lower impedance provides lower internal voltage drop at all loads. This is especially important during peak load periods, since HiperCore Transformers can carry higher overloads than older types, at the same permissible regulation.



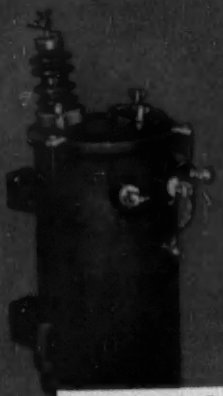
WRITE FOR BULLETIN H-303

ME49-12

MOLONEY ELECTRIC CO.

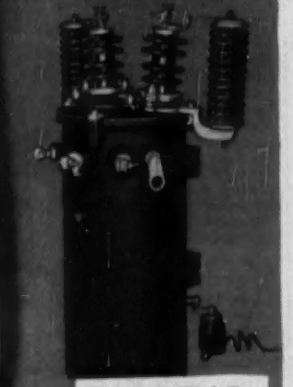
Sales offices in all Principal Cities

FACTORIES: ST. LOUIS, MO. • TORONTO, ONTARIO, CANADA



TYPE CL-1—HiperCore Transformer available in sizes 3 to 100 Kva.

TYPE CL-2 — HiperCore Transformer available in sizes 3 to 100 Kva.



TYPE CSP-CLASS A HiperCore Transformer available in sizes 3 to 100 Kva.

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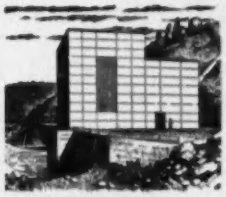
PROFILES

Pictured at the recent AIEE winter meeting at the Statler Hotel in New York: E. C. Starr, Oregon State College, Corvallis; R. R. Crow, Atomic Energy Commission, Richland, Wash.; P. L. Bellaschi, consulting engineer, Portland; N. B. Hinson, Southern California Edison Co., Los Angeles; and E. L. Kanouse, Los Angeles Department of Water & Power. The meeting dates were Jan. 30-Feb. 3

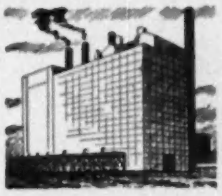
Some NECA chapter managers at a recent California Conference of NECA Chapters meeting in Fresno. Standing, Noyes Alexander, East Central California, Fresno; Will Pregill, California Central Coast, Santa Barbara; Pete Montgomery Jr., San Diego County. Seated, E. R. "Al" Cornish, NECA director, Pacific Coast Region; W. J. Varley, San Francisco Electrical Contractors Assn.; C. R. Walker, Central Valley, Modesto. Varley was recently named chairman of National Electrical Contractors Assn. chapter managers' institute, which meets at convention time to exchange chapter management ideas and plans

A MILLION TAXPAYING HORSEPOWER

Cresta Powerhouse, on the Feather River, came on the line in *November,* 1949 and produces 101,000 horsepower.

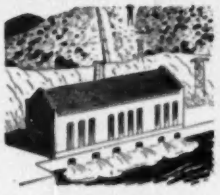


Colgate Powerhouse, on the Yuba River, started pouring out 40,200 horsepower for California in *June,* 1949.



Station "P", the steam giant by San Francisco Bay, added a big 298,000 new horsepower in *February,* 1949.

West Point Powerhouse, on the Mokelumne River, added another 21,000 horsepower in *November,* 1948.



Electra Powerhouse, on the Mokelumne River, produces 133,000 horsepower. It came on the line in *July,* 1948.

Kern Steam Plant, near Bakersfield, began turning out 101,000 horsepower in *May,* 1948. Increased to 235,000 HP last month.

BUILDING A MORE POWERFUL CALIFORNIA

Rock Creek Powerhouse, upstream from Cresta on the Feather River, on the line in *March,* 1950 with 169,000 HP.

Shown here, stacked like giant building blocks, is P. G. and E's answer to the growing need for electric power in Northern and Central California. Seven powerhouses have been completed since the war . . . five of them "hydro" plants on mountain rivers, and two steam-driven. Two more giant steam plants, each designed to produce 402,000 horsepower, are under construction and slated for completion by mid-1951. Here is ample proof that private power companies are able to meet today's tremendous power demands . . . *without subsidy or tax exemption.*

P·G·and E· PACIFIC GAS AND ELECTRIC COMPANY

set your sales course by

the sign of **ADEQUATE WIRING**

In making your plans for steady appliance sales, the sign which says "Adequate Wiring" is a good star to steer by. The homes which display it are your best prospects. They are wired for convenient, efficient and economical use of every appliance—tomorrow's as well as today's—with plenty of circuits, outlets and switches.

Adequate wiring is a source of profit to every appliance dealer. It helps him steer clear of lost sales through unsatisfactory performance or troublesome installation. It keeps the trade winds blowing!

PACIFIC COAST ELECTRICAL ASSOCIATION

601 West Fifth Street, Los Angeles 13, California ● 447 Sutter Street, San Francisco, California